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ROTUNDA

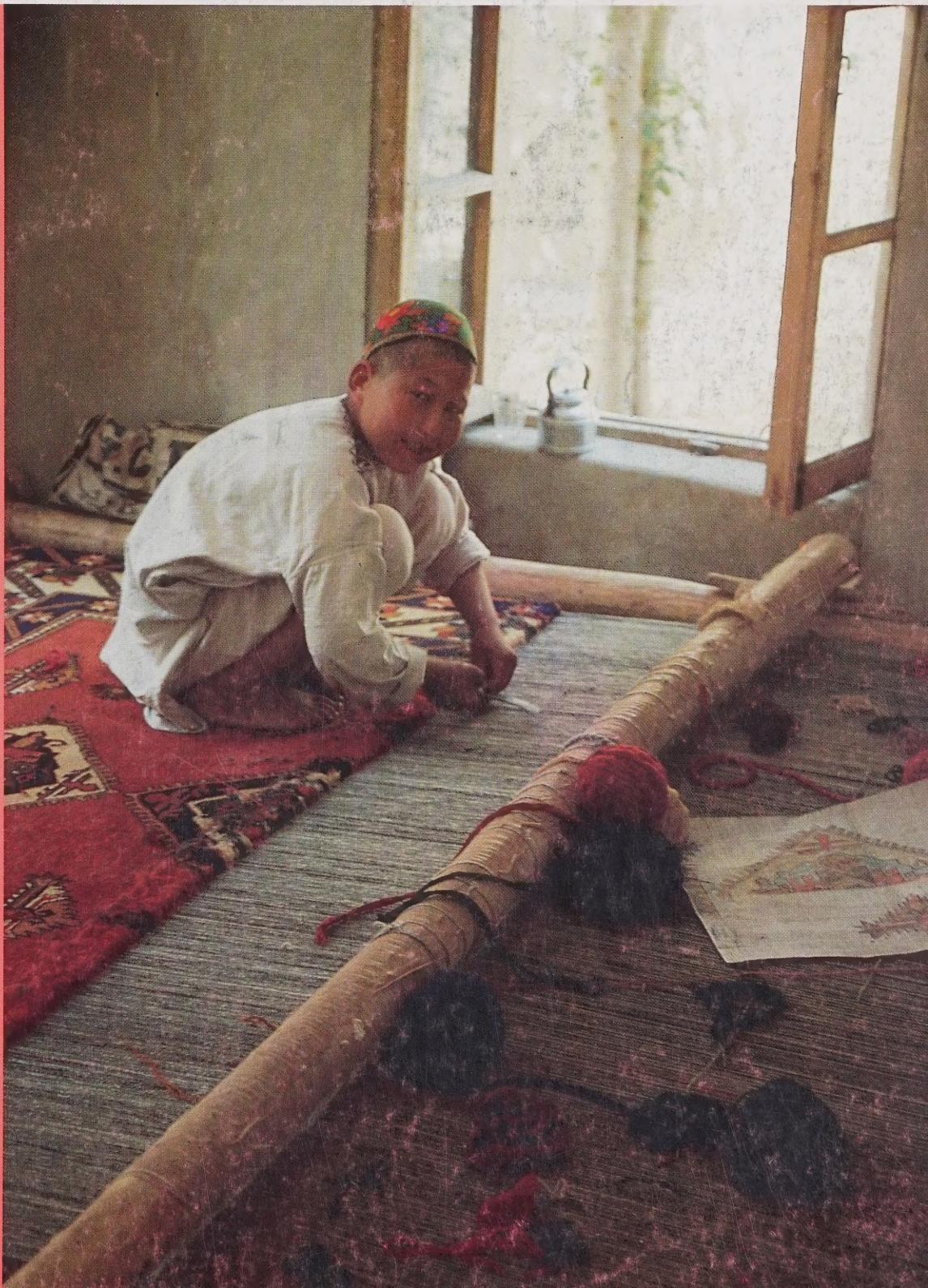
the magazine of the Royal Ontario Museum

**IDENTIFYING
ORIENTAL
RUGS**

**PERFUME
18TH-
CENTURY
DECADENCE
AND
20TH-
CENTURY
RENAISSANCE**

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Canadian Decorative
Arts, Egyptian and
Greek and Roman
departments*

COVER

This boy is weaving an oriental rug by tying thousands of rug knots. Each knot is cut with a curved, hand knife to form pile tufts, which create the pattern. The boy, having memorized the pattern, has discarded the cartoon, which is lying on the warps.

Haq Murad Carpet Company, Aqcha, Afghanistan. To find out more about oriental rugs, turn to page 19. Photo by Louise W. Mackie.



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EDITOR'S NOTE



FOR THE FIRST TIME, *Rotunda* was nominated for a National Magazine Award. Gloria Varley, author of "The Story of Dough," which appeared in the winter issue, is nominated for the Canada Packers Awards for Food Writing. We'll soon know how we're judged by our peers, and we are about to receive a report on your opinions from the readership survey.

Like any printed matter, a magazine is usually less than perfect and our last issue was no exception. The chart on page 30 of Stephen Jay Gould's article should read, "A century of decline in average winning percentages of league-leading teams, calculated by decade."

For your information the cover illustration from the last issue comes from *Let's Play Ball*, written by Bill Humber and co-published by the ROM and Lester & Orpen Dennys. It is an enjoyable book even for non baseball fans.

And now this issue of *Rotunda*. It is no wonder that the young weaver on the cover is smiling. He is part of the latest generation of a craft tradition that has remained vital and essential for millions of people for thousands of years. Louise Mackie, curator in the ROM's Textile Department, offers an excellent introduction to the methods and motives of rugweaving. She refers to several of the rugs recently donated to the ROM by a generous collector, Mr. Sidney Bregman.

While oriental rugs may delight the eye, French perfumes have been treats for the nose for centuries. In the pre-revolutionary days of the late 18th century, the importance of perfume took on dizzying proportions. Perfume was used to scent poorly washed bodies, infre-

quently washed clothes, rarely aired rooms, and wigs that for more than one reason, appeared to have a life of their own. Meredith Chilton, curator of The George R. Gardiner Museum of Ceramic Art, describes the life behind the veils of sweet smells and their wonderful containers, several of which are in the Gardiner collection.

In the 20th century, fragrances are marketed as aggressively as all other things that represent personal success and allure, and their containers play a major role in the marketing schemes. Perfume is big business, yet it is not totally devoid of artistry. Jacques Polge, the creator of *Coco*, is the "nose" for Chanel. He and a handful of other gifted perfumers place art before marketing and business. David Livingstone, a fashion writer, describes the world of the 20th-century perfume laboratory.

The world of perfume is light years away from the world of the deserts of the Sudan where Krzysztof Grzymski, a ROM archaeologist, is exploring the ancient Nubian site of Hambukol. Research is uncovering more about the contacts and influences between the Mediterranean cultures and those of sub-Saharan Africa. And Grzymski explains in his article, how in this particular site, a structure with the unglamorous name of "Building One" is posing a real mystery.

Alberta's Tyrrell Museum of Palaeontology presents an even more ancient picture of our planet. Last September I had the real pleasure of visiting the Tyrrell. I've described my experience in our last feature, and hope that you'll agree that it's a place not to be missed.

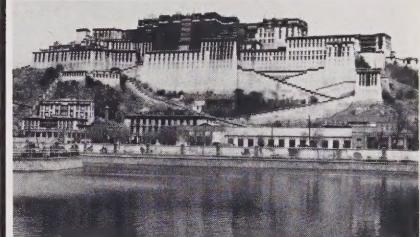

Sandra Shaul

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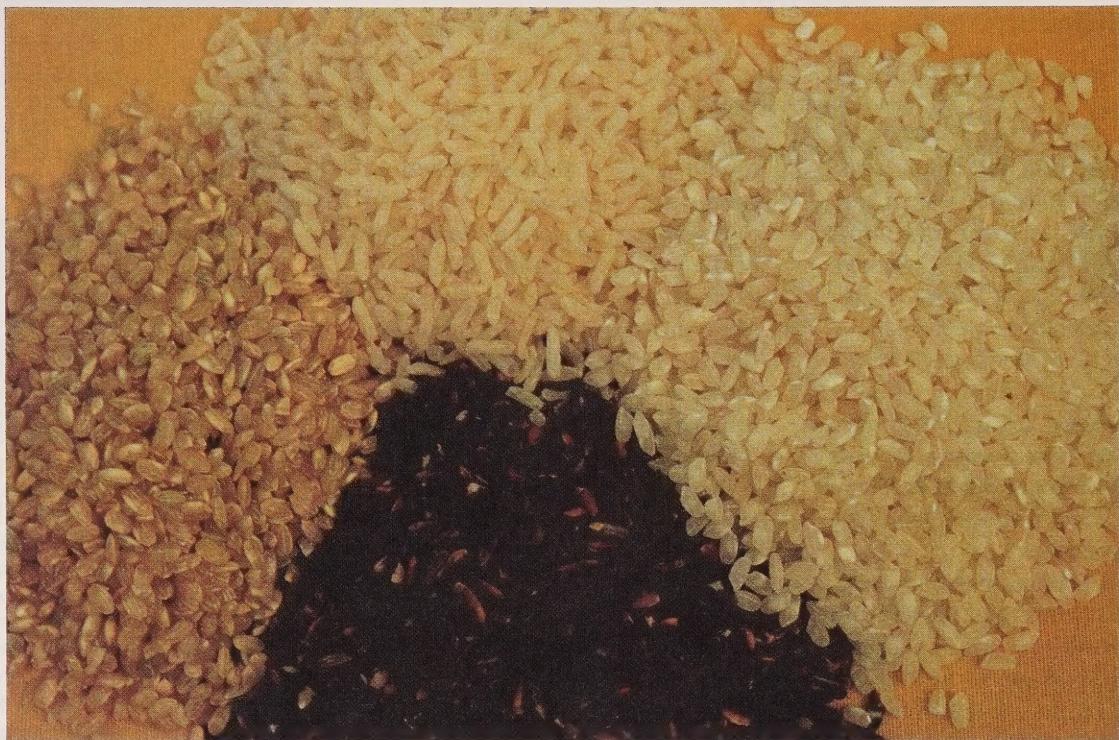
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PHOTOGRAPHY, GLORIA VARLEY



Rice is not always bland in colour and taste. This colourful selection includes, clockwise from bottom: purple Thai rice, brown basmati, and quick-cooking Italian arborio.

The Tyrant of Food

ICE IS A MAZE OF PARADOXES. At the same time it is a blessing, a puzzle, and a curse. The blessing is perhaps self-evident: anything that keeps nearly half the globe's population alive, as rice does, surely qualifies. The puzzle is how to ensure that rice goes on conferring that blessing despite pests, diseases, and disasters natural and unnatural. And the curse is the incessant labour demanded of peasants, farmers, and scientists as they fight to solve the many puzzles that rice poses.

Oryza sativa—the rice most of us are familiar with—is native to the dry valleys of Central Asia, and owes its botanical name to the Greeks. They dubbed it *oriza*, meaning “of Oriental origin” and the name stuck, becoming *riso* in Italy, *reis* in Germany, and *arroz* in

Spain. Asian names are more descriptive. The Indian word *dhanya*, for example, means “sustainer of the human race,” an apt description for a food that alone often makes the difference between life and death.

This sustainer, though now thought of as a tropical crop, is in fact quite at home in a variety of conditions. Upland or dry land rice can be scratched into the ground without too much bother, but it requires an assured annual rainfall of at least 750 mm over the three- to four-month growing period. If the plants dry out, they perish. Although it is used in less than ten per cent of Asia's growing area, this method is most popular in Brazil. The version employed there is a system of shifting cultivation that sees forests burned and the resulting

roughly cleared land cropped for a year or two until its feeble substance finally gives out. Then the whole wasteful process is repeated, leaving nearly irreversible forest damage and land erosion in its wake.

Floating rice is grown in regions subject to deep flooding, such as Bangladesh, Viet Nam, and Burma. The plant stems surge upward as much as five metres to keep their heads above water. It takes about seven months for the plants to mature and the rice is harvested either from boats or after the flood waters have subsided. Lowland or swamp rice spends its life in fairly shallow water. This is the system most of us think of when rice paddies are mentioned: workers barefoot in the water, patiently stooping to set out seedlings. The actuality is far from

bucolic. Especially on the small holdings and terraced hillsides where much of the crop is raised, the backbreaking task is literally endless.

Wet cultivation allows the continual cropping necessary to support high population densities. The so-called Green Revolution further expanded the process, often allowing three crops to be grown where there were only two before. As soon as one harvest is cleared, the next planting gets under way, and in many places the tools and techniques have scarcely changed over the millennia.

What has changed, for good or ill, is the character of much of the rice itself. The International Rice Research Institute was founded in the Philippines in 1962 and, since then, has become a repository for about half of the estimated 120,000 strains in the world. The IRRI is a giant gene bank, still adding to its stock, that aims to "preserve for posterity the fruits of thousands of years of natural and human selection." No small task. Already many of the old species—called land races—have disappeared. The importance of these races to plant breeders is incalculable. These are the crops that evolved over the centuries. The pressures that influenced them had more to do with hardiness and dependability than with high yield, and their genetic diversity provides an insurance pool against unfavourable climatic changes and the ravages of pests and disease.

Accessions, as the rice samples are called, are first dried in a special oven, then packed in vacuum-sealed aluminum cans and stored at 2°C for up to ten years, or at -10°C, at which temperature they should last for about half a century. Periodically the old seeds are planted out and new ones stored in an attempt to ensure their continued viability.

The Institute's great concern is breeding new varieties to improve rice quality and to outwit various

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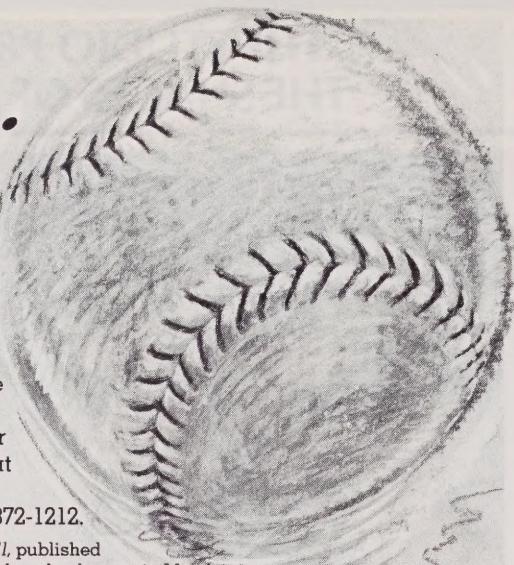
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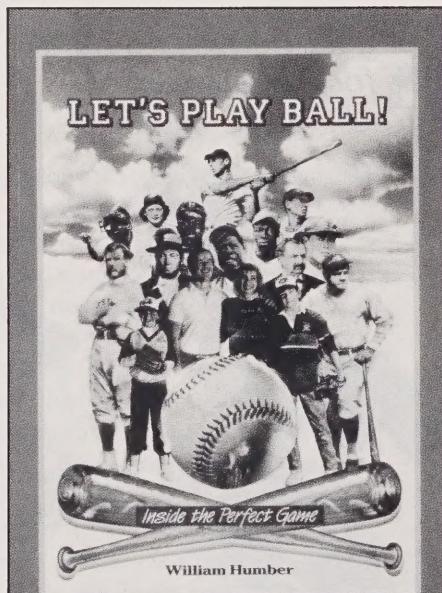
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RICE CONTINUED

enemies. Among its successes: rice that is tolerant of saline soils; rice that has a higher protein content; rice that gives increased yields. But even advances may create problems. Some of the new rices require pesticides in order to survive, and these pesticides poison fish (grown in ponds and channels adjacent to the paddies), which provide the farmers with an essential source of protein. Other strains thrive best under irrigation—available on only one-third of Asia's rice acreage—or require costly chemical fertilizers that the growers simply can not afford.

Researchers are engaged in a constant struggle to solve the difficulties and to stay a jump or two ahead of pests that change only a shade more slowly than the new strains designed to thwart them. As one rice geneticist put it, "The best we can ever hope for with pest management is not to put pressure on the pest to change but to arrive at a state of peaceful co-existence." And a 1979 Institute publication, *Rice Improvement*, described the lot of the researcher with grim fortitude: it "requires years of constant, hard, dirty work, with many failures and rare successes...it demands patience, dedication, continuity, and total physical and mental commitment to field work. Successful rice scientists live with their plants. Unsuccessful ones delegate hard work to assistants and seek physical comfort while writing progress reports and attending conferences."

Rice originated as a food crop around 4500 B.C. and spread from India to China, Tibet, Indonesia, and Japan. Its European débüt, about 300 B.C., is credited to Alexander the Great. The Moors brought it to Spain in the 8th century and by the 15th century it had reached Italy. Here it earned the nickname *il riso amaro*, bitter rice, because it was such a stern taskmaster. Rice appeared in the New World shortly after 1600 and by the end of that century Carolina had become a major source, exporting

much of its harvest through England.

The United States continues to be a substantial producer, but its methods contrast sharply with those in most other parts of the world. First of all, rice actually gives higher yields when grown in a temperate climate. Then, American farmers can afford mechanization to aid their labours, even to the extent of sowing some rice from airplanes, and they also tend to enjoy greater access to improved varieties. It makes a difference: in Asia it takes about 1100 worker hours to bring a single acre of rice to harvest; in the United States the number is reduced to seven hours, and most of the crop, far from being consumed at home, goes onto the world market.

This market is a quirky thing. Rice eaters (or at least those above subsistence level) are an opinionated lot who could put even wine connoisseurs to shame. No single rice can please them all. One Japanese chef recounts, with some glee, how a noted Italian colleague, invited to Osaka, was asked to test an array of rices to see which he considered best for *risotto*. The Italian cooked the samples and then, to Japanese delight, chose correctly: *sasa-nishiki*, "the rice we rate the very highest quality of all! We may not be far wrong in considering Japan a rice paradise."

No doubt some would disagree. Not Italians, for they too prize the short-grain rice that is moist and firm when cooked, with grains that tend to stick together. Indians have an entirely different taste. They treasure long-grain rice that cooks dry and flaky with each grain separate and distinct. In many countries, it's said, there are experts who can discern as little as one per cent difference in starch content between rices, and others who will happily expound on the varying flavours and scents of the finer breeds.

While food for humans is the primary aim of rice growers, it's by

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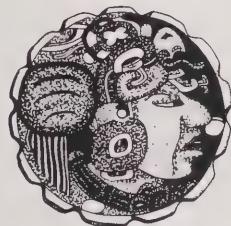
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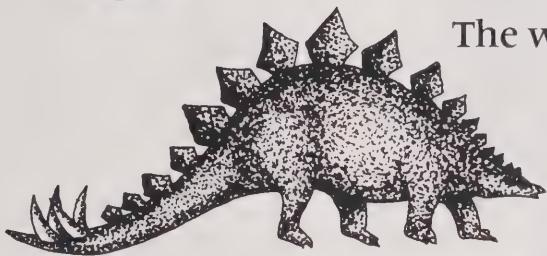
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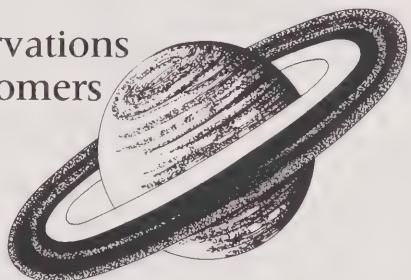
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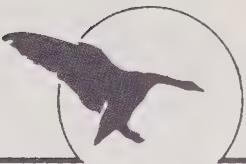
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RICE CONTINUED

no means the only use to which the plant is put. Rice wine is popular in the Far East, as is the rice-based *arak* consumed in many Mediterranean countries. In 18th-century Europe there was even a vogue of sorts for a strong liqueur distilled from rice, possibly in imitation of the Chinese. But, notes one writer—with either regret or disdain—“it is forbidden in France as are spirits made from grain and molasses.”

For the most part, though, it is byproducts of the milling process that are put to other uses. Rice bran—high in nutrients—goes for feed. Rice flour, esteemed by some shortbread bakers, also finds a place in many processed goods, including meat products, pancake mixes, and dusting powder. Rice oil goes into soaps and anti-rust compounds, into shortening and salad dressings, and into a pan-release agent used in bakeries.

Hulls, which comprise about one-fifth the weight of the harvested and dried grains, are very difficult to dispose of. They're tough and woody with little nutritive value and great resistance to weathering; yet ingenuity has managed to find uses for them too. They were once used as fuel in the steam plants that provided energy to the rice mills, but now they're more commonly employed as animal and poultry bedding and as an anti-caking agent in fertilizers. They have been added to bricks, concrete blocks, and panelboard to produce lighter-weight products with higher insulating properties. And, when they are mixed with non-citrus fruits such as apples, grapes, and prunes, the hulls act as a flow aid in juice pressing. Finely ground, they provide the scrubbing factor in mechanics' hand cleanser, and can act as carriers or adsorbents for materials as various as vitamins, pesticides, and explosives.

Despite all this, it's still as food that rice performs its greatest service. It may be plainly boiled and dished up with a few beans or a

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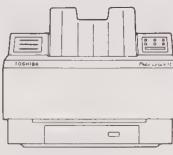
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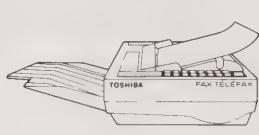
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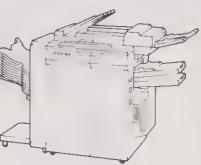
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RICE CONTINUED

scrap of fish for a peasant's meal, or contrived into one of India's elaborate *biryani*s, rich with butter and spices. It can be simmered into the delicate delight of *arroz-doce*, the cinnamon-decked Portuguese wedding sweet, or blown up as a hardy addition to a Canadian breakfast table.

Which brings us to one of life's major mysteries: how does puffed rice get that way? The process was developed by an American scientist in 1904 and it's still going strong today. Preheated rice is fed into the gun—a sort of pressure chamber—and pressure up to 440 kilos (200 pounds) is built up by superheated steam, then suddenly released. The puffed grain tumbles out to be caught in metal hoppers, rather like popcorn on a grand scale.

Converted rice has a much longer history, originating in India where it was probably employed to make the job of hulling easier. At first the rice was simply steeped in cold water, then spread out to dry in the sun, but by the beginning of this century it was realized that prolonged steeping destroys many nutrients. Now the rice is cleaned, steeped briefly in hot water, then steamed at temperatures over 100°C and quickly dried. While converted rice is not as white as the most prized varieties, and suffers from a somewhat bland flavour, it is superior nutritionally because vitamins and minerals from the outer layers are forced into the endosperm. Quick-cooking rice, available since the 1940s, may undergo a number of processes. Essentially, it is precooked, then dried, to maintain a porous structure which absorbs water rapidly as a boon to hurried cooks. Unfortunately, the resulting flavour and texture are unlikely to please those who admire a touch of character along with their starch.

To tickle their particular palates, you might try this *risotto* inspired by a version I encountered at a beautiful inn in the Umbrian town of Tor-

giano, "Le Tre Vasselle." *Rucola*, or *arugula*, can now be found in many vegetable shops—it's also very easy to grow—and the pecorino cheese adds a delicious tang to the dish.

RISOTTO CON RUCOLA E PECORINO

Ingredients

- 30 mL finely chopped onion
- 45 mL butter, divided
- 30 mL olive oil
- 375 mL Italian *arborio* (short-grain) rice
- about 1.25 L good chicken stock
- generous handful fresh *rucola* leaves, roughly chopped if large
- about 175 mL freshly grated Italian pecorino cheese
- salt, if necessary

Method

• Sauté onion in 30 mL butter and all the oil until the onion just begins to colour. Add the rice and stir until it's well-coated and glistening.

• Meanwhile, in a separate pot, bring the stock to a simmer. Begin adding it to the rice, a ladleful at a time (about 100 mL). Stir almost continuously and, as each ladle of stock is absorbed, add another. (Should stock run out, use water for the last ladleful.) The rice should be always moist, but never swimming, and it should cook over a fairly brisk heat so that it absorbs the liquid, yet doesn't become gummy.

• After fifteen minutes or so, begin tasting a grain; it will be plump and tender to the bite when it's done, but not chalky at the centre. When the cooking time is nearly up, add the *rucola* and stir it through the rice.

• Continue to cook for a few moments, adding stock sparingly, until the rice is ready. Then stir in the cheese and the remaining butter and taste for salt. The dish should have a creamy quality, not at all soupy.

• Remove from heat and serve immediately with additional grated cheese if you like. Serves 4.

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THE GROWING COLLECTIONS

Below: An unusual Canadian tea service dating from 1797 will enhance the Canadiana collection, and an 18th-Dynasty (1567-1320 B.C.) comb completes the ROM's Egyptian New Kingdom toilette. Right: A fine example of a statuette of the Egyptian goddess Isis nursing her son Horus.

PHOTOGRAPHY, ROYAL ONTARIO MUSEUM



Two acquisitions will enhance the new Egyptian galleries

The Egyptian Department has gratefully received, through Mr. Hugh Ward Higson, the bequest by Mrs. Heather R. Y. Higson of a bronze statuette of the goddess Isis nursing her son Horus. Although the department has several such objects, this one is the finest and most complete. It will be a welcome addition to our future Egyptian religion gallery.

The statuette, which is 25 cm tall, dates from the 26th Dynasty (663-525 B.C.) and is an example of an icon that was popular from New Kingdom to Roman times. It depicts Isis, sister and wife of Osiris, as the mother of Horus, the god associated with kingship. Isis wears a headdress decorated with horns, a



sun disk, and a cobra, symbols of divinity and royalty. Her long wig is decorated with gold wire inlay and the eyes appear to be inlaid as well. Horus wears the side-lock of youth as well as the royal cobra on his head.

Isis was the most popular goddess of ancient Egypt. Her legend has assigned to her the act of bringing her husband, Osiris, back to life after he had been slain by his brother, Seth. She became increasingly typified as the strong, devoted wife and mother with magical powers of creation and protection. Greece and Rome readily adopted

Top: Three of the gifts recently donated to the Greek and Roman Department include a wall painting, a vase from Centuripe, and a gold garnet earring.

this goddess and the early Christians borrowed and assigned some of her attributes, such as her epithet, "Queen of Heaven," to the Virgin Mary.

Horus is most familiar as the falcon god so closely associated with the king that all pharaohs were considered to be "the living Horus" while they reigned. The best-known of his exploits is the struggle that he endured (ultimately to victory) with Seth, his uncle, both to avenge the murder of Osiris, his father, and to maintain his legitimate succession as divine ruler of the gods. This statuette may have been used in the home as an icon for personal protection, or dedicated to a temple as an act of piety.

The Egyptian Department also purchased with the assistance of

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COLLECTIONS CONTINUED

the Future Fund Today—ROM Endowment, an 18th-Dynasty (1567-1320 B.C.) comb, probably made of sycamore fig. It has taken several years to find such a comb to complete the Museum's New Kingdom "toilette," which will be used in the future galleries to illustrate the typical cosmetic accoutrements of a New Kingdom lady.

A good example of an ordinary wooden comb from this period, it has evenly spaced and sized teeth (two of which are missing) with the exception of the two outer teeth, which like those of modern combs are thicker. The decoration on the spine consists of three tangs and four incised lines running the length of the spine, two above and two below the tangs. Decoration on the spines of combs of the period range from the simple design of this comb to intricate carvings of graceful animals.

ROBERTA L. SHAW
Egyptian Department

An unusual Canadian tea service for the Canadian Decorative Arts Department

IN 1797 JUDGE JAMES MAY OF Detroit commissioned an ornate four-piece silver tea service from Robert Cruickshank of Montreal, one of the most prolific Canadian silversmiths of the late 18th century. Each piece was engraved with the date "1797" over the word "May." The service was purchased by the ROM with funds from the Bieniewski Bequest, and is now in the collection of the Canadian Decorative Arts Department. It is on display in the Sigmund Samuel Building.

Canadian silver tea services of the 18th century are rare; fewer than a dozen are known, and most of these comprise three pieces. The lidded tea caddy of the May service is the only one known to have been produced by any early Canadian silversmith. This service is also unique in its family history, having descended directly through seven generations of daughters.

James May (1756-1829) moved to Detroit from England in 1778. He traded furs between Detroit and Montreal. Not only did he succeed as a merchant, but he also served as a judge and as chairman of the Detroit city council. After the British left Detroit he became U.S. Adjutant General and later U.S. Marshal for the Michigan Territory.

DONALD WEBSTER
Canadian Decorative Arts Department

Three donors give art and jewellery to the Greek and Roman Department

DR. ELIE BOROWSKI HAS PRESENTED the Greek and Roman Department with gifts of two Roman wall paintings and a vase from Centuripe, Sicily. The two frescos, dating from the 3rd century A.D., depict a Dionysiac maenad and a servant girl. With their impressionistic style, they are excellent examples of late Roman painting. The Centuripe vase is decorated with a scene thought to be from a Greek play, and is dated to the 3rd century B.C. The bright colours on the vase are a rare example of original Greek polychromatic painting.

The Greek and Roman Department is also the fortunate recipient of important gifts from two other donors. A fine Hellenistic gold and garnet earring and a Roman terracotta bust of a boy were donated to the department by Mr. Robert E. Hindley. The superbly crafted earring, from the 3rd century B.C., consists of a disc containing a rosette and a pendant in the shape of an amphora. The figurine of the boy is of a type that was popular in the Near East during the Roman period and is dated to approximately the 3rd century A.D. A draped male bust of a Roman, made from volcanic stone in the 3rd century A.D., is the gift of Mr. Andrew Watson.

The Museum is grateful to the three donors for their generosity.

PAUL DENIS
Greek and Roman Department



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SINCE THEIR INVENTION MORE THAN 2500 years ago in Asia, oriental rugs have been admired for their colour, pattern, durability, and warmth in tents as well as palaces. The oldest known carpet, excavated from a frozen tomb dating to the 5th century B.C., at Pazyryk in Siberia, is remarkably similar to rugs woven in the Middle East today.

Oriental rugs are woven traditionally in sheep-rearing areas across Asia and North Africa wherever cold weather occasions their use, in mountain as well as desert areas. Settled and nomadic people have woven rugs for their own personal use for centuries since they are the primary furnishings and furniture in Middle Eastern living quarters. Yet rugs have always been luxuries, for their manufacture requires many resources, special skills, and a great deal of time.

Rugs also have been woven commercially for both local and export markets for at least a thousand years. By the 14th century, Turkish rugs were considered exotic status symbols in Europe. Renaissance painters awarded them a place of honour by depicting them beneath the Virgin and Child. In houses, they were shown off and preserved on tables. When placed on floors, rugs were laid first and foremost in

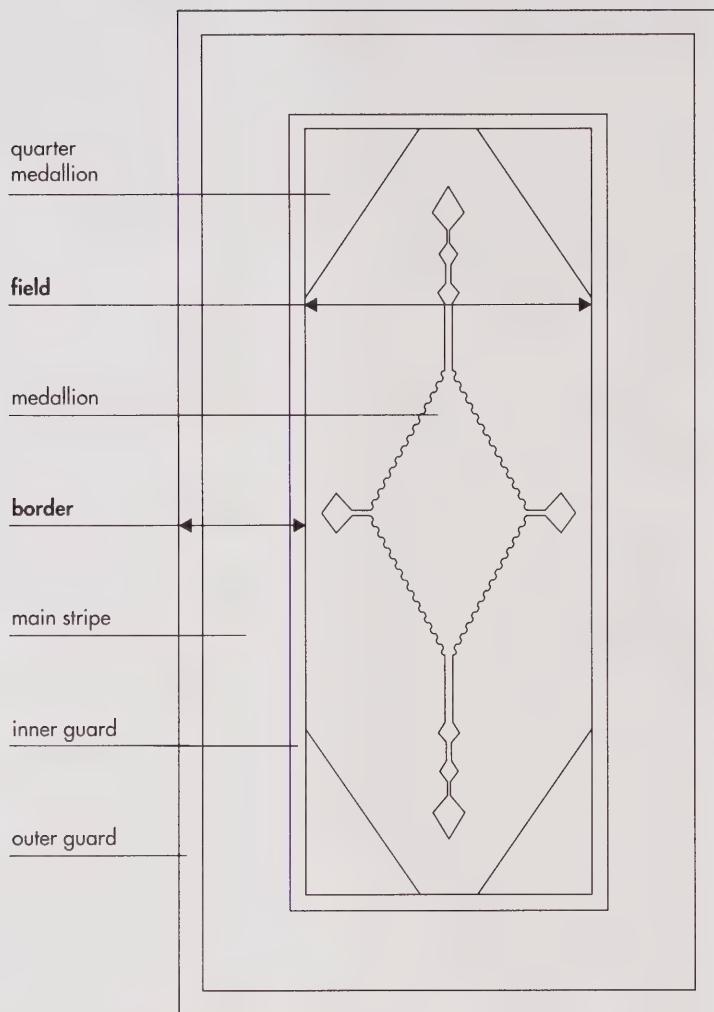
Louise W. Mackie is curator of the Textile Department, Royal Ontario Museum

PHOTOGRAPHY, BILL ROBERTSON

HOW TO IDENTIFY ORIENTAL RUGS

Sidney Bregman's recent donation to the ROM of forty-one splendid oriental rugs provides the perfect opportunity to learn the basics of rug identification

LOUISE W. MACKIE



When the demand for exotic rugs in the West skyrocketed about one hundred years ago, a strain was put on the existing resources and skills, which in some instances affected appearance and quality.

living rooms, where they could be admired by guests. Relatively few rugs were used on bedroom floors until about one hundred years ago when Western demand for exotic oriental rugs skyrocketed. Suddenly production doubled, even quadrupled, in some areas such as Iran and the Caucasus, spearheaded by native and Western entrepreneurs.

The increased demand put a strain on existing resources and skills which in some instances affected both appearance and quality. New patterns were added and some traditional Islamic patterns were adapted to Western taste by the softening of colours and the changing of sizes to accommodate the proportions of Western rooms; nevertheless, the maintenance of good craftsmanship was recognized as critical to the long-term success of the industry.

Each stage in the preparation and the weaving of oriental rugs is done by hand, and requires great care and skill. Rugs are identified by their pattern, colour, fibre content, and woven structure. Together these four factors provide the most reliable method for determining where and when rugs were made, and for revealing aspects of the culture that created them.

* * *

ANY PATTERN CAN BE WOVEN IN AN ORIENTAL rug in any number of colours. There is enormous artistic freedom, as is evident from the astounding variations of comparatively few motifs. Rug patterns are composed of motifs that are organized to decorate a specific shape, usually a rectangle. The main pattern fills the field, which is framed by a border displaying narrow designs in the main and guard stripes.

The organization of different motifs of various sizes, shapes, and colours into harmonious yet dynamic patterns is the hallmark of good oriental rugs. Motifs overlap and interlace. The favourite motifs of blossoms and leaves, some rendered in more realistic styles than others, are always fancifully coloured. They evoke lush gardens that can be admired throughout the year, regardless of the actual weather. Such gardens are often associated with paradisical gardens described in the Koran. Yet in spite of the myriad effects, the field patterns are usually organized in one of three basic layouts: centralized, allover repeat, or pictorial.

Centralized layouts are characterized

by one prominent central motif, usually a medallion, which dominates the field. Often one-quarter of a medallion also decorates each of the four corners of the field. Different versions of blossoming vines cover the medallions and field, each woven with contrasting ground colours. Such patterns can be viewed from any direction.

Centralized layouts are among the most demanding to weave. They require large, graph-paper cartoons (usually one-quarter the size of the field) drawn by an artist to plan the pattern for the weaver or weavers to copy. The weaver must pay exceptional attention to ensure the correct placing of each coloured rug knot (pile tufts). Consequently, rugs with centralized patterns are woven in controlled contexts, either in workshops or as cottage industry. This layout evolved from Islamic court art, primarily in 16th-century Iran, which continues to influence contemporary designs today.

As the name implies, allover repeat layouts are planned to repeat a design all over the field. The infinite repetition is only contained by the framing border. Although the designs are often small, their shapes and colour variations can create vastly different effects.

Rugs with allover repeat layouts are the most traditional and include the 2500-year-old-Pazyryk carpet. Artist-drawn car-

toons are sometimes used; they contain only the single design to be repeated. Usually, however, the design is memorized with repetition. Allover repeat layouts are woven in tribal, village, and urban settings. Their use for patterning rugs is always an artistic choice, often based on regional or tribal traditions, and not influenced by any technical features on looms such as occurs, for example, in coverlets. Inevitably, there are variations of the layouts. One popular version displays medallions that are repeated, but not infinitely, since they are not severed by the borders.

The third type of layout, known as pictorial, falls outside the mainstream of oriental rugs. Human and animal figures form directional patterns that fill the field. Such patterns have been woven primarily in Iran.

Colour is the second factor for identifying oriental rugs. Bright colours are preferred by rug weavers because the prevailing brilliant light of the Middle East washes out subtle hues. The colours appear even more intense in our more subdued northern light.

The colours used in rugs tend to be specific to certain areas. For centuries, skilled dyers made brilliant fast colours from natural dyestuffs, either plant or animal, often using secret family recipes. Then, in the 1860s, the invention of synthetic dyes in Europe revolutionized the dye industry. By the 1880s, they were used by settled and nomadic weavers. Although some of the earliest synthetic dyes were not colourfast, more recent dyes such as the so-called chrome dyes are.

Since colour is so critical to the appearance of rugs, dye-



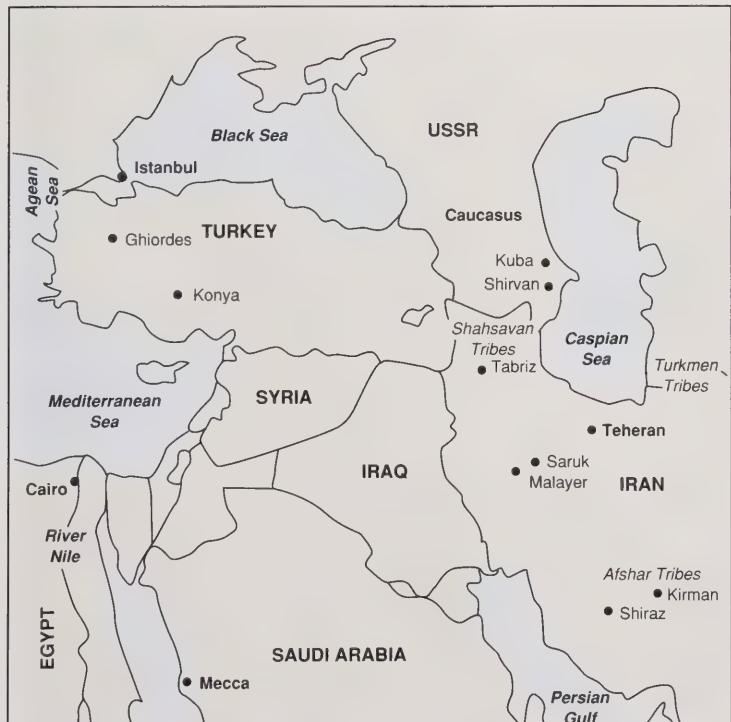
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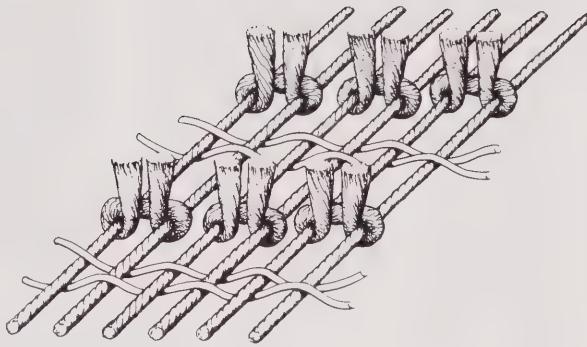
PHOTOGRAPHY: LOUISE W. MACKIE

Top: This Turkmen woman is spinning short woollen fibres into yarn on a drop spindle, one of the many time-consuming tasks required to prepare yarn for weaving. The springiness of wool lets it withstand matting, thereby making it the best fibre for oriental rugs. Settled Turkmen in Bakraz, near Eskişehir, Turkey.

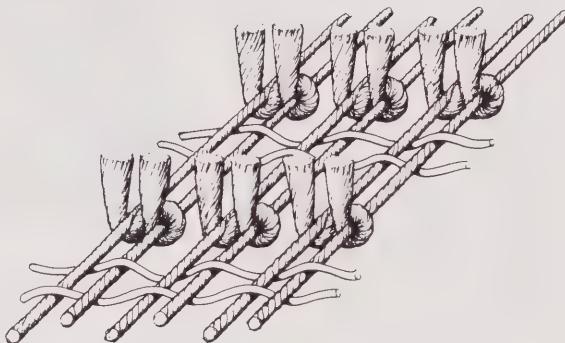
Bottom: Rug weavers often copy cartoons of rug patterns until the patterns are learned by heart. Here the master designer is painting squares black to indicate the critical contours. Each square represents one rug knot tuft, thousands of which are needed to form the complete rug. Iran Carpet Co., Kirman, Iran.



Each symmetrical rug knot is individually wrapped around two warps so that the projecting pile emerges between the warps. Each row of knots is beaten tightly into place and further secured by one or more wefts.



Each asymmetrical rug knot is individually wrapped around (usually) two warps so that one tuft of pile emerges between each warp.



Although wool is the most practical fibre for oriental rugs because of its resiliency, the brilliant sheen of silk makes rugs of this fibre the ultimate luxury.

stuffs have sometimes been disputed among manufacturers and weavers. For example, an 1890 survey in the Caucasus records: "If the rug is for you, you use natural dyes. If the rug is for sale, you use commercial dyes" (Shelley and Wright, "Caucasian Rugs in the Late Nineteenth Century," *Hali*, 3:1, 1980, 5).

The ability to determine whether a dye is natural or synthetic develops as an educated guess that can only be confirmed by chemical analysis. Colours made from natural dyes contain the nuances of colour from several combined dyes, and therefore tend to produce a softer effect than colours made with synthetic dyes, which generally produce a single shade and consequently a harsher effect. However, colours are also affected by the type of wool or other materials used, the acid/alkaline content of the washing water, and the age and condition of a rug.

The third factor for identifying rugs is fibre. The pre-eminent fibre for rugs is wool. It is strong and resilient which makes it a practical and durable choice. Since wool accepts dyes well, it can be dyed any colour. It is also surprisingly lustrous, the result of light reflecting off the minute overlapping scales of the fibres.

Wool qualities vary depending on the breed of sheep and the location of the fibres on the fleece. In contrast with soft, fine wool suitable for sweaters, coarse, hairy wool is required for rugs—it enables the pile tufts to stand erect without matting. Rug wool traditionally comes from native Asian sheep, especially from around the necks and shoulders of fat-tailed sheep. Skilled craftspeople process the wool fibres into yarn in many time-consuming stages. The distinctive qualities of woollen yarn provide a means for identifying the region of origin.

Although most carpets are all wool, sometimes cotton and silk are used. Certainly, silk carpets are the ultimate luxury wherein the practicality of resilient wool is sacrificed for the brilliance of silk.

The fourth factor considered when identifying rugs is the woven structure. The knotted-pile structure of oriental rugs allows great artistic freedom and is not technically restrictive.

Rugs are woven on simple rectangular looms on which warp yarns are stretched taut. Pile tufts, or rug knots, create the pattern. They are formed by wrapping a

yarn around two warps so that the yarn ends project towards the weaver who cuts them with a knife to form each tuft. When one row of rug knots is complete, wefts are inserted across the rug and beaten tightly against the rug knots to form a sturdy fabric.

The process is repeated over and over again. Rows of rug knots alternate with rows of wefts until the pattern is complete. This can take weeks or months, depending on the size of the rug, the number of rug knots, the dexterity of the weaver, and the time available for weaving. After the rug has been taken off the loom, the pile is carefully clipped to ensure an even surface. The rug is then washed.

The number of rug knots in a measured area affects the appearance of designs, whether the drawing is angular or curvilinear. Since rugs are made of horizontal and vertical elements, rug knots create designs with horizontal and vertical lines more readily than those with diagonal lines. Diagonal and curved lines require a greater density of knots.

Generally speaking, curved lines require at least two hundred rug knots per square inch; the higher the knot count, the more detailed the design. Although higher knot counts produce more tightly woven rugs, they will not necessarily last longer than those with lower knot counts and they are not inherently superior. The

pattern in each rug is an expression of the knot density and interlacing structure. Any evaluation of rugs must also take into account the quality of the colours and the fibre.

Since craft habits rarely change, variations in rug structures tend to be specific to individual regions. Woven structures may be distinguished by the type of rug knot, knot density, pile length (weight), evenness, number of wefts, heading and finishing treatment, and the selvedge treatment.

* * *

USUALLY THE PATTERN, COLOUR, FIBRE, and structure immediately reveal where a rug was woven. However, in some instances, the pattern is not a reliable indicator.

Sometimes weavers produce rugs with several different patterns—all woven with the same structure, fibre content, and colours. The patterns may be traditional to the people of a particular region or tribe, or they may be copied from elsewhere, or they may even be newly designed versions of established styles from urban workshops. Since patterns can be easily copied by anyone, anywhere, they are less reliable for identifying rugs than the structure, fibre, and colour, all of which result from entrenched craft habits.

The origins of some patterns are easier to determine than others. Many were adapted from patterns in other art forms and then copied for decades, even centuries, with only slight variations. This honoured continuity confounds dating attributions.

One popular design is the pear-shaped boche or "paisley" motif. It was high fashion in the Middle East and in Europe during the 19th cen-



PHOTOGRAPH: LOUISE W. MACKIE

Top: In this airy mud-brick building, several weavers work simultaneously on a rug, each weaving the facing area. Depending on local customs, males or females weave rugs on either horizontal or vertical looms. Incidentally, these factory weavers also work as farmers. Haq Murad Carpet Co., Aqcha, Afghanistan.

Bottom: Before the advent of rail, motor vehicle, and air transport, commercially woven rugs and bulkier carpets were carried to markets by donkey, camel, and whenever possible, by ship. Tribal rugs were woven for personal use, rather than sold commercially, and therefore fewer old tribal rugs survive. Fez Morocco.

Helpful Terms

Plain weave (tabby) The simplest interlacing of warps and wefts in unvarying alternation, i.e., over-one-under-one.

Rug knot (knotted pile) A discontinuous extra weft wrapped around (usually) two warps to project to form the pile. Each rug knot is individually wrapped and cut. The two primary knots are: symmetrical (Turkish, Ghiordes) and asymmetrical (Persian, Senneh).

Selvedge (selvage) The two woven side edges of a fabric.

Warp Yarns that run lengthwise in a fabric from one end to the other, interlaced at right angles by the wefts. Warps are stretched taut on looms before weaving begins.

Weft (woof) Yarns that run crosswise in a fabric from selvedge to selvedge, interlacing the warp at right angles.

Sidney Bregman

Sidney Bregman appreciates the fine craftsmanship involved in making oriental rugs and enjoys admiring them. He searches for well-balanced designs and

harmonious colours in old rugs that are in excellent condition. These high standards have guided his collecting ever since he selected his first rug in 1961. Asked if he has a favourite rug, Mr. Bregman paused, "No, it's like children, each has its own mystery and appeal."

He learned about oriental rugs by "training my eye with as many exposures as possible (which) included looking at photos in books and reading. ...I wanted to know about a rug before I bought it." He acquired many of his rugs in the Toronto area.

His appreciation of rugs has been influenced

by his profession: Sidney Bregman is a founding partner of Bregman and Hamann, Architects, a firm that has been responsible for major projects such as Toronto's Eaton Centre. Initially, he was attracted by the geometric designs in Caucasian rugs, which he "associates with contemporary interiors." The more he collected, the more he realized that "good old Persian rugs with floral designs have a certain intellectual appeal and a great impact on the design of some tribal and village rugs."

In 1986, Sidney Bregman donated his collection of forty-one oriental rugs, complete with books on rugs, to the Royal Ontario Museum. The rugs were woven about one hundred years ago in cities and villages and by nomadic tribes in Iran, the Caucasus, and Turkey, and they are major additions to the holdings of the Museum. As the practice of traditional craftsmanship declines around the world, the ROM's ability to preserve this collection as well as make it available for study and exhibition will benefit future generations. Mr. Bregman's generosity is acknowledged with sincere gratitude.



Sidney Bregman has contributed to the general public's appreciation of rugs through his donation to the ROM, and his role as founder and president of the Oriental Rug Society in Toronto. The Society organized Oriental Rugs in Canadian Collections, an exhibition with catalogue in Stratford, Ontario, in 1975.

tury, and was used to pattern rugs woven in Iran and the Caucasus. Organized in rows facing in alternate directions, botehs offer interior spaces where additional patterning, often in whimsical colours, creates astoundingly varied effects. The boteh motif acquired the name "paisley" as a result of manufacturers in Paisley, Scotland, trying to imitate shawls with these motifs that were exported from Kashmir, India, during the 19th century.

In contrast with the West where oriental rugs are accessories that enhance rooms, in the Middle East they are integral to the living customs and consequently they have long been woven in sizes and proportions to suit distinct functions. People sit, relax, eat, and sleep on the rugs; they admire the interplay of colour and design.

The patterns of some rugs readily identify their function. Prayer rugs are distinguished by the presence of a prayer niche in the field. The niche represents a *mihrab* in the mosque wall that is oriented towards Mecca, the holiest city of Islam. Just as there are many styles of *mihrabs*, there are many types of prayer rugs. Since prayers can be performed on any clean surface, prayer rugs are luxuries used by comparatively few, often in homes.

Storage bags, on the other hand, have long been essential to nomadic tribes for storing and transporting their possessions during seasonal migrations. Some bags are more elaborately decorated than others; the decoration is an indicator of tribal identity as well as wealth in terms of resources, time, and craftsmanship. Storage bags are often small and can be identified by the horizontal or square formats of their patterns instead of the vertical format of floor rugs. Although bags are woven in one piece, only their visible fronts have elaborate patterns; the backs are woven in the simpler structure of plain weave. Usually only the patterned fronts reach the West.

Oriental rugs are intended to delight the eye. They also astound the mind as the extensive craftsmanship is recognized. However, one must spend time gazing at their colours and patterns, just as one must take time to listen to a symphony or read a poem, in order to understand the harmony of the parts. Only with time are the true beauty and pleasure of oriental rugs revealed.



Superb colours, fine design, and lustrous wool enhance this Persian rug. Real and fanciful floral and foliate motifs are arranged in a centralized medallion framed by one wide and two narrow borders. The comparative scale of the motifs and the colour hues are critical to the artistic success of this rug. Curving vines, bearing imaginative blossoms in varying sizes and tones, were copied by the weavers from a paper cartoon. The curvilinear designs on this rug were achieved with a high knot count. Iran, Saruk or neighbouring village, late 19th century; all wool, 414 asymmetrical knots per square inch. Length: 150 cm (59"), Width: 104 cm (41"). Gift of Sidney Bregman.



Centralized medallion patterns have been woven in Iran for five hundred years. Often the design in the central medallion differs from that in the corner quarter medallions. The ground colours may also contrast as with the blue and red of this rug. In the main border stripe, tulips and curving serrated leaves alternate with small cartouches. Most rugs with such curvilinear patterns are either woven in controlled workshops or as cottage industry in the villages. In the latter circumstances, dyed yarns and patterns painted on graph paper are supplied to the weavers whose work is inspected periodically. Western Iran, Malayer, c. 1900; cotton warp and weft, wool pile, 225 symmetrical knots per square inch. Length: 193 cm (76"), Width: 142 cm (56"). Gift of Sidney Bregman.

Arranged as an allover repeat pattern, this popular paisley motif was copied by Persian tribal weavers from city patterns found in Kirman. Typically, the pattern is more angular than it appears in urban-manufactured rugs because tribal weavers generally use woven structures with fewer knots per square inch. The rug's origin is immediately revealed by two structural features: the colourful chevrons across the ends, woven with supplementary west wrapping called soumak and the bicolour selvedges along the sides. **Iran, Kirman area, Afshar tribe, early 20th century; all wool, 94 symmetrical knots per square inch. Length: 178 cm (70"), Width: 117 cm (46"). Gift of Sidney Bregman.**



Since pattern, such as the popular paisley motif, can be copied easily, the most reliable factors for identifying rugs are their colours, wool quality, and woven structure. These three factors represent entrenched craft practices. In this case they reveal that this handsome prayer rug was woven in the same Caucasian area as the two rugs on page 28. The paisleys, here with angular saw-toothed profiles, are ideal forms for displaying random interior colours and motifs. The arch in the field that represents the prayer niche or mihrab in a mosque identifies this as a prayer rug. The keel-shaped arch is typical of most Caucasian prayer rugs. **East Caucasus, coastal plain (trade name: Marasali Shirvan), late 19th century; all wool, 90 symmetrical knots per square inch. Length: 155 cm (51"), Width: 109 cm (43"). Gift of Sidney Bregman.**





The colours, structure, and pattern of this attractive village prayer rug reveal its Turkish origin. The greatest variety and quantity of prayer rugs have been woven in Turkey for at least five hundred years. Prayer rugs, always identifiable by a prayer niche, were copied from generation to generation as an honoured tradition. Occasional changes have crept in: for example, on this rug there are tulips growing upside down across the bottom of the niche instead of upright across the top. Western Turkey, 2nd half 19th century; all wool, 56 symmetrical knots per square inch. Length: 124.5 (49"), Width: 112 (44"). Gift of Sidney Bregman.



Several shades of red typify tribal Turkmen rugs. The rugs often display small repeating medallions called "guls" that evolved from blossoms. Tribal Turkmen rugs were traditionally woven in northeast Iran, Afghanistan, and the southern Soviet Union but have been widely imitated for decades by settled weavers. A young Turkmen girl probably wove this luxurious storage bag as well as other functional tent furnishings for her dowry. Knotted-pile storage bags are symbols of tribal wealth because they require more wool, dyes, skill and time to create than unpatterned bags. When exported, the plainer backs of the bags are usually removed. In this instance the weft was unravelled leaving the warps exposed as a long fringe. Northeast Iran, Yomut Turkmen tribe, 2nd half 19th century; all wool, 153 symmetrical knots per square inch. Length: 83 cm (33"), Width 116 cm (45.5"). Gift of Sidney Bregman.

Charming Caucasian, folk art animals and geometric motifs form this well-balanced yet whimsical field pattern, which is framed by three borders of varying widths and designs. Colour and scale are keys to its success. On the rich blue ground, light colours highlight the primary motifs while richer tones de-emphasize the smaller motifs in order to create a harmonious appearance. East Caucasus, coastal plain (trade name: Shirvan), late 19th century; all wool, 95 symmetrical knots per square inch. Length: 152 cm (60.5"), Width: 107 cm (42").



Glorious colours, a well-organized pattern, and lustrous wool rank this as a superb Caucasian rug, despite its slightly askew shape. Some angular motifs obscure their floral origins: the angular motifs on the white ground border evolved from 16th-century Turkish motifs and serrated leaves. East Caucasus, coastal plain (trade name: Shirvan), second half 19th century; all wool, 175 symmetrical knots per square inch. Length: 143.5 cm (56.5"), Width: 108 cm (42.5"). Gift of Sidney Bregman.





Unlike the other rugs illustrated, this Persian tribal storage bag is called a flat weave because it does not have any projecting knotted pile. The pattern is woven with supplementary weft wrapping called soumak. The small size and square format indicate that it was the front of a saddle bag for transporting dry goods, especially during seasonal migrations. The back of the bag has been removed. White cotton has been used in the pattern, possibly a purchased luxury; white cotton is often more brilliant than white wool. Northwest Iran, probably Shahsavan tribe, late 19th century; dyed wool and undyed cotton, soumak wrapping. Length: 53 cm (21"), Width: 51 cm (20"). Gift of Sidney Bregman.



The age of old rugs is difficult to determine unless there is a woven date. But even they require evaluation because the dates can be copied as easily as patterns. The date at the top of this rug is plausible—Muslim year 1321 (A.D. 1903-04). The accompanying text has not been deciphered. Woven in the same area in the Caucasus as the two rugs on the facing page, this rug reveals design similarities and variations. Here, three central cruciform medallions on a dark-blue ground are punctuated with prominent squares, paisleys, angular animals and birds, and small trees and blossoms. Graded sizes and colours are keys to combining such disparate motifs into the harmonious, yet dynamic field pattern. The lively interplay of colour and design invites contemplation; the more one looks, the more one sees. East Caucasus, coastal plain (trade name: Shirvan), dated H. 1321/A.D. 1903/04; all wool, 126 symmetrical knots per square inch. Length: 185 cm (73"), Width: 114 cm (45"). Gift of Sidney Bregman.

A RETURN TO NUBIA

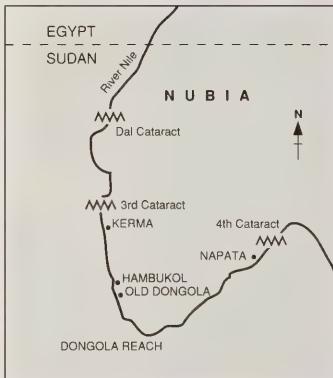
*Excavations in the Sudan
are revealing
a vast cultural maze*

KRZYSZTOF GRZYSKSI

THE ARCHAEOLOGICAL MONUMENTS OF NUBIA, THE LAND along the Nile south of Egypt, have always been overshadowed by the treasures of Nubia's northern neighbour. However, in the 1960s, when the Egyptian government decided to erect a dam across the Nile at Aswan, there was a brief moment when all matters Nubian were of special interest.

The creation of an artificial lake, although beneficial to the Egyptian economy, led to the complete inundation of the region between the First and Second cataracts of the Nile, which is known as Lower Nubia. An international campaign, launched by UNESCO to safeguard the monuments of Lower Nubia, attracted much worldwide attention to Nubia's magnificent past and to the importance of this land to our understanding of the contacts and influences between the Mediterranean cultures and those of sub-Saharan Africa.

But with the completion of the Aswan Dam and the gradual flooding of the Nile Valley all the way up to the Dal Cataract in the Sudan, field activity in Nubia came almost to a standstill. Somehow the region further south, known as Upper Nubia, did not arouse as much interest among scholars, perhaps because many of them





ROM archaeologists came across several very large mounds of sand that existed along the Nile north of Old Dongola in the Sudan. They covered ancient settlements that were abandoned in the 14th or 15th century. The great rise of the main mound of one such settlement, Hambukol, can only be appreciated when viewed from the air.



were still mainly interested in ancient Egypt. Only a handful of archaeologists stayed in what became a new field of scholarly specialization—Nubiology.

Unlike Egyptologists, who deal basically with one homogenous culture, specialists in Nubian studies are concerned with a whole group of different, although often related, cultures. The mysterious Kerma Kingdom, centred in the Third Cataract region, may be regarded as the first truly African empire, which during its heyday (c. 1780-1560 B.C.) formed a formidable threat to Egypt itself. Eventually Kerma fell to the pharaohs of the 18th Dynasty, who had extended Egyptian control as far south as the Fourth Cataract. Egypt had imported from Nubia not only skins of exotic animals, ivory, and ebony, but also gold. In return the Egyptians adorned the Nubian countryside with numerous temples and shrines. Their ruins stand as reminders of the long-lasting Egyptian occupation of this land.

What happened after Egypt's withdrawal around 1080 B.C. is still unclear, but some two hundred years later another indigenous culture developed on the Nile. It is known to scholars as the Napatan-Meroitic Kingdom, named after its two principal cities, Napata near the Fourth Cataract and Meroe near the Sixth. About a thousand years later the Napatan-Meroitic civilization gave way, first, to an enigmatic X-Group culture, and then to the Christianized Nubian kingdoms of Nobadia, Makuria, and Alwa, which lasted until the 14th century A.D. All of these different ancient Nubian civilizations left rich archaeological remains, such as temples, pyramids, and cathedrals; yet only a limited amount of excavation has been carried out in the Sudan. There are many gaps in our knowledge of the history and archaeology of Nubia that remain to be filled.

Small groups of Sudanese and foreign archaeologists are battling great odds to study and save ancient remains in what is now Africa's largest country. Archaeological projects in Nubia are complicated by a lack of roads, occasional shortages of food and goods, and the devastation that has hit the Sudan during the last decade. Civil war raged in the southern part of the country, and in the western and eastern regions there was a drought and subsequent famine that caused the deaths of thousands of people and forced others to escape to the refugee camps near the rivers. When the long-awaited rains finally poured down in the summer of 1988, they were as disastrous as the earlier drought. This time the villages and towns located along the rivers were hardest hit. The Nile

reached one of the highest levels recorded in this century. While the spread of malaria and other diseases was contained, the situation was aggravated by the appearance of locusts.

The plagues that had been previously known to us only from the Bible suddenly became a present-day reality, and though I had worked in the Sudan for many years, I began to have second thoughts about going to the field in 1988. In the end, however, I decided to take a risk and go ahead with the Royal Ontario Museum's project.

The grant from the Social Sciences and Humanities Research Council arrived on time, the Sudan Antiquities Service arranged the visas for us, and letters from Khartoum simply stated that life was going on, although there was a scarcity of food and goods. Consequently, every member of the expedition was obliged to bring a suitcase full of food and medicine so that we would be self sufficient.

All that was missing was news from Nubia. This area had been the hardest hit by the Nile flood and communication was completely cut off. Some reports said that all villages had been destroyed, but since the high water had taken some time to reach Nubia, I was certain that there would have been no loss of life. However, I could not stop thinking about the village of Hambukol, where we had been excavating since 1986. Our dig house was presumably gone, along with all the equipment accumulated over the years. What prompted me to proceed was the thought that at the worst we could simply distribute food and medical supplies among the needy people; and if the situation was not as bad as reported, we could offer well-paid work on the dig.

On arrival at Khartoum I learned that the overland routes to Nubia had become passable and that the bus service had been resumed. Our Sudanese colleagues were as helpful as ever, and the population at large was surprisingly cheerful and confident in

spite of the recent disasters. The prospects for a successful field season looked brighter, except for one thing: there was still no news from Hambukol. However, I learned from bus drivers that the river was still very high and that there were no ferry-boats to the east bank where Hambukol is situated. The buses stopped well before reaching the river and so travel to the river was by camel or donkey. The Nile crossing was being made in small sailboats. I considered this to be good news, and so after securing the necessary travel permits we left for Nubia.

To reach the Nile from Khartoum, we had to cross

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Hassan, a native Nubian who assisted the ROM team at the site, poses on his magnificent camel.



ROM archaeologist, Krzysztof Grzymski, officially opened the Hambukol excavations in October 1986. Already much has been revealed about the various cultures that inhabit this part of Nubia. Archaeologists want to learn more about the contacts and influences between the Mediterranean cultures and those of sub-Saharan Africa.

the Bayuda Desert. The crossing is normally a pretty straightforward matter taking no more than one day. Yet a desert is a desert. Our Landrover was loaded with enough fuel and water to last several days in case we wandered off the main tracks, as we had sometimes done in the past. This time our crossing was uneventful. As always we left Khartoum clean and elegant, and arrived in Ed Debba tired and filthy, and covered with dust. For the past two years Mr. Alex Tilley of Toronto has provided us with his famous unsinkable sailors' hats. Our crossing the Sahara wearing unsinkable hats had

something surrealistic about it and remained a source of constant amusement for us.

However, there was nothing amusing to be seen at Ed Debba and other settlements on the west bank of the Nile. Ruined houses dotted the landscape. Ponds and lakes were still to be seen great distances away from the river. Nevertheless, the waters had started to recede and the local people were rebuilding their houses, this time far away from the Nile. They were generally very optimistic, a reminder that the Nile floods are as ancient as the land itself, and ultimately a blessing in disguise. The

Nile carries the most fertile soil on Earth, and by flooding large areas it expands the cultivable land. There is now the promise of a very rich harvest in the year to come.

As our luck would have it, the ferry boat service had just resumed and we were able to cross the Nile to Old Dongola, a medieval capital of Nubia, only six kilometres south of Hambukol. We were amazed to see that hardly any buildings had been affected by the flood. In contrast to the west bank, the east bank of the Nile, which is slightly higher, was flooded in only a few places.

Even our dig house, which lies only 200 metres away from the river, was in fair condition. Though one room had collapsed and water had flooded our storage room, most of our effects were unharmed because they had been placed high enough on shelves and tables. The house had been further protected because it is built on a *kom*, a small mound covering ancient remains. Indeed, it was an extraordinary reversal of normal circumstances that this time the archaeologists were saved by the antiquities. We were able to start our excavations immediately.

The site of Hambukol (the Nubian expression for "the place of a dom palm") is but one of many discovered between 1984 and 1986 by the ROM team during the surface survey conducted in this part of the Nile Valley (see *Rotunda* 18:3, 1985/86). It was then that we came across several very large mounds of sand that extend along the Nile north of Old Dongola. All of these mounds covered ancient settlements that were abandoned and buried by the sand, probably in the 14th or 15th century. Their existence in this part of the Nile Valley was not a complete surprise. Rather it confirmed in my mind the report of a 10th-century Arab traveller and writer, Ibn Selim al-Aswani, who mentioned a district of "about thirty villages with beautiful buildings, churches and monasteries." Al-Aswani was wrong in one respect: some of the settlements found by our expedition were large enough to be cities rather than mere villages. We were thrilled to have discovered, once again, "the lost cities of the Sudan."

On the basis of the surface finds, I thought Hambukol to be the most representative of the sites because the artifacts found during the survey dated back to the early centuries of the Christian era. However, before committing ourselves and the Museum to what was clearly a long-term project, we undertook trial excavations in the autumn of 1986. The results were most exciting: we discovered a well-preserved building encapsu-

lated by sand. Its plan was similar to that known from Egyptian and Nubian medieval churches, yet there were some bothersome aberrations from the standard plan. This was both annoying and intriguing, and the need to conduct further work on the site became evident.

After that first trial dig we returned to Hambukol in the fall of 1987, and again in 1988. The uncovering of what we unromantically called "Building One" showed that this was *not* a church; its plan was more complex than it had seemed at first, and it also had two latrines, something unthinkable in religious buildings of the time. What, then, was the function of this large structure? Was it a palace, a bawdy-house, or a monastery? The answer still eludes us. Building One remains something of an enigma.

This mystery may have something to do with the protective magic bowls that were placed under the four corners of the building. The bowls were inscribed in Greek letters with the names of archangels and saints. Their function was to keep the demons away. It was indeed an extraordinary coincidence for us to have found these magic bowls, since one of the best-known collections of magic bowls from Mesopotamia, another part of the Near East, is displayed in the Levant Gallery in the Royal Ontario Museum.

The superstitious will be delighted to learn that when we let the demons out of the bowls we were plagued with problems: two members of the expedition caught malaria, a surveyor who visited our site broke his theodolite, and colleagues who came to see Hambukol had to leave their car for two weeks when the axle broke right on the site. It is possible that the Nile flood purified the site again because our last season was problem free. The jinns left us alone.

During the last season in 1988, we unearthed the remains of ordinary houses and found another magic bowl, this time uninscribed, placed under the doorway. We also began cutting the slope along the west

wall of the Building One/House One complex, trying to determine what sort of structure, if any, was located underneath. Since my digging philosophy is to make large horizontal clearances before progressing further with vertical cuts, it will take several more seasons before we reach Meroitic or even earlier levels. In fact, one of the most stimulating discoveries was a small potsherd lying on the bottom of the slope. This particular fragment appears to belong to the Kerma period and dates to around 1600 B.C., moving back the history of our site by sixteen centuries, an exciting portent for future excavations.



This attractively decorated bowl, dating about A.D. 850-1100, was found on the surface of the main mound of Hambukol.



Above: The Building One/House One complex is impressive, even from some distance. Left: This interior view of Building One shows the walls were made of mud brick and were once white-washed. The pillar at the back and to the centre was red brick. Right: Beneath what was presumed to have been a foundation, the top of another structure has been found.



THE TYRRELL MUSEUM OF PALAEONTOLOGY

BRINGING PREHISTORY TO THE PRESENT

*Canada's only museum dedicated solely to palaeontology
brings together superb collections of ancient fossils
with the best in modern museum technology and research*

SANDRA SHAUL

THE TYRRELL MUSEUM OF PALAEONTOLOGY IS SURROUNDED by badlands, country that leaves a vivid impression on visitors used to viewing museums in urban settings. The drive from the small city of Drumheller, Alberta, probably best known for its penitentiary, to the Tyrrell struck me as a Mesozoic version of the route that leads through the Tuilerie Gardens in the heart of Paris to the Louvre.

Overwhelming ramparts of extremely eroded rock and huge dirt mounds tower dramatically above the road which, all at once, broadens into a clearing. There, in the centre, sits the hi-tech palace of palaeontology. Regardless of the ultra-modern architecture, the Tyrrell fits as comfortably into its surroundings and is as suitable a home for its collections as that other illustrious and traditional institution. Like the badlands, the museum peels back the layers of time to expose a fossilized picture of life dating back to the Cretaceous period, which ended about 65 million years ago.

The museum is named after Joseph Burr Tyrrell. In the spring of 1884, at the age of twenty-seven, Tyrrell made the first dinosaur discovery in the Drumheller area. Tyrrell was on a mission to find coal seams, not dinosaurs, for the Geological Survey of Canada. The abundant bituminous coal seams that he uncovered attracted entrepreneurs like Samuel Drumheller, who started mining operations in and around the town of Drumheller in 1911. Coal mining reached its peak in 1948, when there were more than forty operating mines. However, as oil and gas replaced coal in importance, Drumheller declined.

It was while studying the exposed rocks at Kneehill Creek that Tyrrell found the skull of an animal that had

Many of the specimens included in the Tyrrell's outstanding displays were excavated from the surrounding badlands. With the aid of a helicopter lift, museum staff load a plaster jacket and some field equipment onto a flatbed trailer.



Sandra Shaul is executive editor of Rotunda

lived about 70 million years ago. The find was of a hitherto unknown genus, later named *Albertosaurus*. Swept up by the gold rush, Tyrrell resigned from the G. S. C. in 1899 in order to work as a mining consultant. He died in Toronto in 1957 at the age of ninety-nine.

The decision to build the Tyrrell Museum in the vicinity of the first dinosaur find was not simply an attempt to establish a tourist industry in an economically depressed region. When the Provincial Museum of Alberta, located in Edmonton, could no longer accommodate an ever-growing fossil collection, it made sense to create a museum dedicated to palaeontological history in the place now recognized as one of the world's richest sources of dinosaurs. In fact, some of the most remarkable recent finds have been made only a few hundred metres from the building, brought to the surface, in some instances, by the construction of the building itself. The museum opened to the public on 25 September 1985.



The museum's mandate is to collect, conserve, research, display, and interpret palaeontological history with a special reference to Alberta. The Tyrrell succeeds magnificently, its most important achievement being the reestablishment of credibility to a field of research that has often been perceived by scientific factions, as well as by the general public, as tainted by science fiction.

The theme of the Tyrrell is "A Celebration of Life." A self-guided tour of the two floors of exhibits explains, through a multitude of specimens and unobtrusive but easily accessible didactic displays, the origins and history of life according to the latest research and theories. No theatrics are necessary. As visitors grasp the concepts being presented and begin to understand the total pic-

ture, there is enough satisfaction in discovery to keep them stimulated and eager for more.

The tour starts with a description of the formation of our planet and its place in the solar system. This is followed by an explanation of the work of the museum's staff in their quest to better understand the evolution of life and our planet. After these brief displays a third display presents an introduction to fossils.

An interesting sidelight, located just beyond the introduction to fossils, is a window that allows visitors to look behind the scenes at the preparation laboratory. When I was there, a *Tyrannosaurus rex* fossil skull, one of the few ever found, was being prepared.

In the next exhibition area, the story of Earth and of the evolution of life begins to unfold in earnest. The effects of continental drift on the environment and on the distribution of the world's flora and fauna, as well as Darwin's theory of natural selection, are explained.

Then through a wonderful juxtaposition of ancient fossils and living specimens that are descendants of the ancient species, the exhibition continues the story up to life at the time of the ice ages. The very effective technique of comparing ancient and modern life makes the exhibits of the Tyrrell special.

There are four outstanding display

areas. The first, located on the upper floor of the museum, contains Burgess Shale fossils, which show life during one of the most experimental eras of all time. Among animals that seem familiar to modern viewers are others that look more like characters from the film "Star Wars." In fact this display made me impatient for the ROM's new Burgess Shale gallery. The ROM is a leader in research on this subject.

After descending to the main floor, visitors can take a temporary break from the exhibits to wander through a large palaeoconservatory, which contains plant species related to those that grew in the Alberta area during the dinosaur era. The ancestry of some species can be traced to the Devonian period, 350 million years ago. At the time of the dinosaurs, Alberta was warm and humid; forests and swamps, on the deltas, and the coastal plains of an interior seaway supported an abundance of diverse plant life that is known to us through fossil remains found in sedimentary rock. Some species have barely changed during the last 180 million years.

Plants found in the palaeoconservatory are similar to



those now found in Florida, California, Malaysia, Singapore, Australia, and New Zealand. The umbrella pines and katsura trees, plentiful in Alberta during the Cretaceous period, are only found in the Orient, and the sycamore, also common to Alberta during the Cretaceous, grows only in the southeastern United States. There is also one of the best collections of cycads (plants with palmlike foliage) in Canada. Such plants were so common at the time of the dinosaurs that this era is also referred to as the Age of Cycads.

From the palaeoconservatory the visit continues back in the galleries with the remarkable Dinosaur Hall. In the centre of the hall, the fossilized skeletal remains of several animals are posed as if stopped suddenly in action. One can never help pausing for a few minutes before such displays in order to imagine the animals as flesh-and-blood living beings.

The Tyrrell takes visitors one step further by showing the collective imagination of the staff in a three-dimensional diorama that borders the hall. There, fleshed-out models, posed exactly as the skeletal reconstructions, stand in replicas of the landscape as it was during the dinosaurs' reign. In one scene, an *Albertosaurus* looks as if it is about to walk right up to you. The staff affectionately call this model Lillian. They were tired of specimens of this species always receiving the pet name of Albert.

However, exciting as the Dinosaur Hall may be, the Marine Gallery, which follows, is equally fascinating. The fossil remains of marine animals, in traditional mounts, are juxtaposed with aquaria full of their living descendants. It requires little imagination to grasp the concept of the continuity of life in its varying stages of evolution over millions of years.

The tour continues with the Age of Mammals, located directly across from the Dinosaur Hall, a provocative arrangement that gives rise to a moment or two of reflection. Finally, a small concluding gallery describes life on Earth during the ice ages.

Following a visit to the museum, a walk along the trails in the surrounding badlands of Midland Provincial Park should not be missed. This bizarre landscape has been formed by the extreme erosion of sedimentary rock layers, which has led to the exposure of even older sedimentary layers dating back to the dinosaur era. As these older layers of sediment erode, fossils are exposed.



The site of the excavation in progress near the building can be inspected, and even though the badlands do not represent the landscape as it was in the time of the dinosaurs, their shocking appearance combined with the abundance of fossils, often right underfoot, makes it virtually impossible not to wonder about the world that was. When the visitor returns to the museum entrance, the modern building no longer seems out of place; the walls no longer separate inside from out. The museum exists in harmony with its environment.

If by this time you are not saturated with dinosaur data, you can visit the Field Station of the Tyrrell Museum about 150 kilometres away in Dinosaur Provincial Park. The park, which comprises 75 square



kilometres of badlands, was declared a UNESCO World Heritage Site in 1979. More than thirty-five species of dinosaurs, representing almost every group known from the Late Cretaceous, have been found here.

The colours and textures of the Field Station, which opened 15 May 1987, were chosen and designed to blend with the environment. Inside there are displays depicting life situations by the use of casts of fossils and scale models. Films and videos screened in the theatre explain the methods of collecting fossils, and the history of the park. As in the museum itself, there is a window onto the preparation area.

The first-rate reputation that the Tyrrell has earned internationally is a tribute to its staff. As Canada's only museum dedicated solely to palaeontology, it has a core staff of forty-two employees, which includes seven scientists with doctorates in the fields of palaeontology, sedimentology, or biology. Among the scientists, Dr. Philip



Currie, assistant director, collection and research programs, is particularly prominent. In part this is due to his involvement with the museum from its earliest planning stage when he was curator of palaeontology at the Provincial Museum of Alberta. It is also due to the outstanding research that he has undertaken while at the Tyrrell; this includes the Canada-China Dinosaur Project described in *Rotunda* (21:4, Spring 1989).

Like a growing number of scientists, Currie believes in an interdisciplinary approach to research. He prefers dinosaur palaeontology to straight geology because "it is associated with so many other fields." But Currie is sensitive about the publicity that dinosaur buffs rather than scientists have received. Dinosaur research projects receive little funding compared to some other areas of research; the "gee, wow, reaction to dinosaurs leads the scientific agencies to consider palaeontology a science for the masses, and therefore not serious."

Yet he also sees a very positive side to the popularity of dinosaurs. "Dinosaurs have an intrinsic value in introducing people, especially children, to science." The Tyrrell receives about 500,000 visitors each year.

I have visited the antithesis of the Tyrrell: the Museum of Natural History in Paris. It is a beaux-arts style building located in the middle of a splendid, urban botanical garden. The displays are very traditional—skeletons in static poses—and so old that the ink of the handwritten labels is faded, often beyond the point of legibility. When I asked Currie how he would compare the Paris exhibits to those at the Tyrrell, he described the Parisian museum as charming; he felt that there was room for both approaches to displays, as long as they weren't in

the same place. He then went on to say that at the Tyrrell they prefer to display real, or casts of real, fossils rather than fleshed-out models.

The dioramas of the Tyrrell's Dinosaur Hall bring to life skeletal reconstructions that are also displayed in the hall and in the Field Station. Darren Tanke prepares and plasters a bone fossil so that it can be safely removed from Dinosaur Provincial Park.

Then how could he explain the important role of the models in Dinosaur Hall? If there is a drawback to this gallery, it is the inflexibility of the exhibits. Should anyone wish to replace one of the fossil specimens or change its pose or its interpretation, there would have to be extremely costly modifications to the diorama.

Currie feels that Dinosaur Hall is a reflection of the Tyrrell's approach to research on dinosaurs and other animals. He also feels that any characteristics of behaviour or physical appearance that the models show are based on substantial evidence. He added, however, "It will be interesting to see how well they will stand up even ten years from now. What we've tried to do with the paintings and three-dimensional models is illustrate the process of coming to conclusions that are brought together into a palaeo-ecological total picture." These are not the sensational sets and models of horror films or carnal "museum" displays. Currie's own work, which takes him from the badlands of Alberta to the Arctic and China, and which includes exchanges with scientists around the world, is aimed at understanding the global picture of dinosaurs, from their physical appearance to their behaviour, to their environments.

One other initiative that impressed me in Alberta is the preservation of palaeontological resources through the Historical Resources Act passed in 1978. This act declares as Crown Property all historical natural resources. The museum carries the message to the public in many ways, including a ban on the sale of any real fossils or objects made from fossils in the museum shop.

The Tyrrell Museum is a captivating union of specimens of the oldest forms of life with the best in modern museum display, conservation and preservation, and research techniques. It should be visited by everyone who knows the pleasures of studying natural history.



PARFUM ET EAU DE PARFUM DE CHANEL

Mme de Pompadour at her Toilette,
1758, by François Boucher (1703-1770),
oil on canvas, 81.2 x 64.9 cm, Fogg Art Museum,
Bequest of Charles E. Dunlap. Mme de
Pompadour is wearing a cape to protect her
clothes from rouge and other cosmetics while
they are being applied.

*“Pleasure
is like
a delicately scented flower.
One must
only inhale gently
if one is to find
the same perfume
again and again.”*
(Laborde)



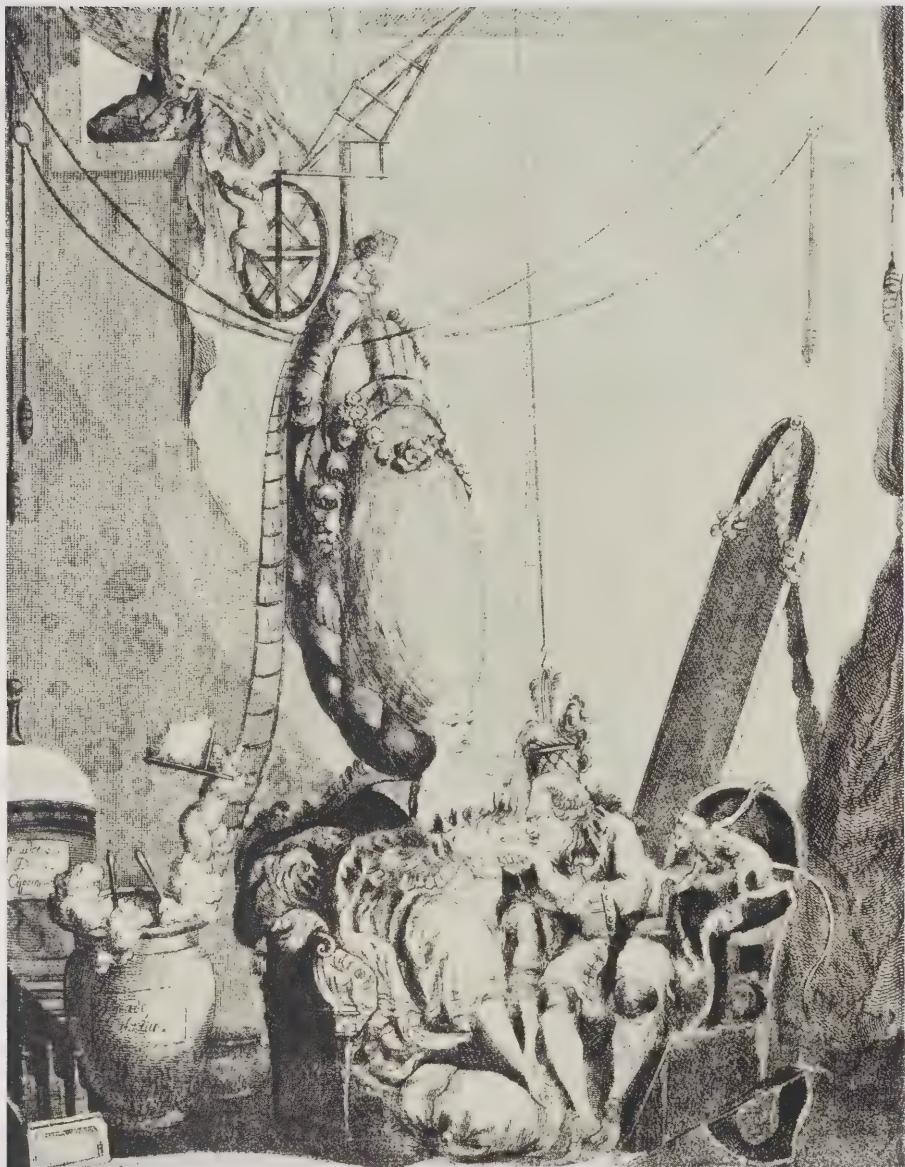
A FUGITIVE PLEASURE PERFUME IN THE 18 TH CENTURY

*The pervasive smell of decadence
has never been so sweet*

MEREDITH CHILTON

TO RECALL THE EPHEMERAL PLEASURES OF THE privileged in the 18th century is to invoke the Rococo period, marked by its frivolity, lightness, and hedonism. The art of Boucher offers intimate glimpses of

nymphs and shepherdesses. There were water gardens and chinoiserie pavilions, the fleeting delights of taking tea alfresco, witty conversations and flirtation in the salon or the boudoir, the refinement of



Love's Strategy

engraving by Charaire
In her boudoir, where she
is being coiffed, a young
woman receives her hus-
band or elderly suitor.
Meanwhile, a correspon-
dence is maintained with
her lover.

taste became the principal concern of the aristocracy. Perfume, like porcelain, was a symbol of luxury and fashion. No one in France had more influence on fashion and taste than Louis's mistress, Mme de Pompadour. She was a prolific user of perfume, purchasing hundreds of thousands of *livres* worth each year from merchant-traders such as Lazare Duvaux, whose records show that she bought *Eau de Portugal* and *Huile de Venus* from his shop "Au Chagrin de Turquie" (The Turkish Lament) on the rue Saint-Honoré.

charm and elegance of manner, and of course, the elusive scent of perfume.

In France, the Court of Louis XV, where the pursuit of pleasure was paramount, became known as *La Cour Parfumée*. Good

Perfume became an intrinsic part of fashionable life. It was used in a wide variety of products, one of the most popular of which was perfumed gloves, a conceit introduced during the 16th century. *Neroli*, a scent made from bitter-orange blossoms, named for the Duchess of Neroli, was the favoured fragrance for gloves of the period. A prohibitive tax on hides, introduced in the 1760s, devastated the industry, which was centred in Grasse and Montpellier. Many *gantiers-parfumeurs*, or perfumed-glove makers, moved to Paris to become simply perfumers. One, Jean-Louis Fargeon, became Louis XV's perfumer.

Perfume was also an important ingredient in cosmetics and hairdressing. Upon rising, the lady of fashion would attend to her toilette. "The role of a young Beauty is much more serious than you can imagine. Nothing is more important than what happens at her toilette in the morning," wrote Montesquieu. First a foundation called *plâtre*, or plaster, was applied. It often consisted of fine white clay, ground pearls, honey, and gum. In spite of criticism from the medical profession, many recipes called for powdered white lead. It was combined with pomade, a thick paste similar to modern cold cream made from a mixture of pure white lard and essential oils of violets, jasmine, or lilies-of-the-valley. This foundation was then carefully applied to the skin to conceal wrinkles.

Rouge came next. A typical recipe for Carmin rouge involved pulverizing a mixture of talc and cochineal, and then stirring in olive oil and gum. Rosewater was then added before the rouge was transferred to small pots. It was applied to the face with a small brush or a spherical suede tampon.

Finally, beauty spots were applied. These were small pieces of black fabric, cut in a variety of fanciful shapes such as hearts and crescent moons, which were stuck onto the face with gum. The placing of patches was an art in itself and involved much discuss-

sion at the dressing table. While dressing, a lady might be joined in her boudoir by her paramour, friends, and relatives, as well as by tradesmen, musicians, and hairdressers. Advice would be given on the position of a curl or the placing of a beauty spot. Each location of a beauty spot on the face had a name and a significant meaning. Thus a lady might inform everyone of her moods and intentions by wearing "the discreet," "the passionate," or "the coquette."

However, lovers of artifice in Britain had to be wary since an act of the British Parliament in 1774 declared: "Any woman of any age or rank found deceiving, seducing, or leading into matrimony any of His Majesty's subjects through the use of perfume, wigs or any cosmetics shall incur the penalties laid down for sorcery, and the marriage shall be declared null and void."

After dressing and the application of cosmetics came the arranging of the hair. Wigs had been introduced by Louis XIII and were initially worn only by men, who sported cascading curls of brown or black human hair or horsehair in the latter years of the 17th century. Under Louis XVI the fashion changed and extraordinarily elaborate wigs were worn by both men and women. Ladies' wigs became so extreme that hairdressers were obliged to use small ladders to arrange the topmost curls. Wigs were usually powdered either grey or white. The powder was made of talc, a soft mineral that was ground, purified, and sometimes supplemented with china clay or starch. It was sifted through silk screens and scented with essential oils. The most popular perfume for wigs in the 18th century was orris root, which smelt slightly of violets. Powder would be applied to a lightly pomaded wig in a "powder room." Ladies and gentlemen would protect their clothes with large dust cloths, and hold cone-shaped masks over their faces to prevent the powder from settling on their make-up.

This elaborate toilette required several hours of preparation in the boudoir. Most

ladies of fashion never appeared in public before noon. Consequently, small meals were eaten while dressing took place. Elegant ewers and basins were made so that ladies and gentlemen might rinse their fingers in rosewater after partaking of a light repast in the bedroom upon rising, or later in the boudoir. A fine Sèvres example of these articles is in the collection of The George R. Gardiner Museum of Ceramic Art. The factory was established at Vincennes in 1738 and moved to Sèvres in 1756, where it became the Royal French Porcelain Manufactory under the patronage of Louis XV.

Of course, ladies and gentlemen did not only wear scented gloves, wigs, and cosmetics. They also applied large quantities of perfume directly to their bodies. Perfume was not an 18th-century invention but had been used as scent for the body, in medicine, and for religious purposes for thousands of years. The art of making perfume had been greatly enhanced by the introduction of distillation in the 2nd century. Much experimentation in perfumery was carried out by early Islamic scientists, and Europeans benefitted from this knowledge. By 1370 the first European perfume, in the modern sense, appeared. It was a mixture of essential plant oils and alcohol, originally based on oil of rosemary but later with additions of oil of lavender. The perfume was named for Queen Elizabeth of Hungary and was called *Hungary Water*.

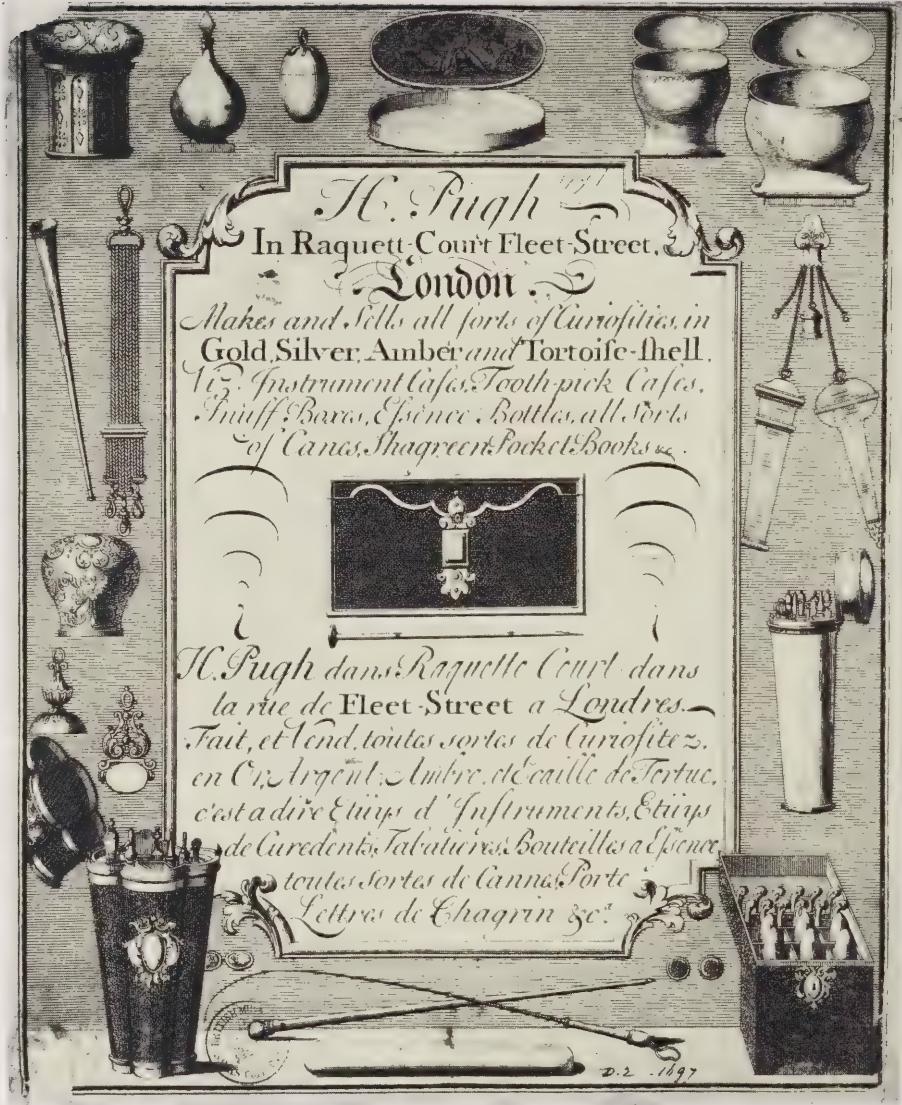
The most famous perfume of the 18th century was *Eau de Cologne*. It had been invented by 1732 by two Italians, Gian Paolo Feminis and Giovanni Maria Farina, whose business was established in Cologne. *Eau de Cologne* was the perfume preferred by Mme du Barry, another mistress of Louis XV. Other perfumers experimented with a wide variety of extractions of precious oils, including bergamot, lavender, and rosemary, which were the principal ingredients of *Eau de Cologne*. However, most perfumes of the period had only a single

Any woman of any age or rank found deceiving, seducing, or leading into matrimony any of His Majesty's subjects through the use of perfume, wigs or any cosmetics shall incur the penalties laid down for sorcery, and the marriage shall be declared null and void.

Act of British Parliament, 1774



Chinese girl scent bottle, c. 1752-54, soft-paste porcelain, 9.5 cm high, English "Girl-in-a-Swing" factory type, The George R. Gardiner Museum of Ceramic Art. This charming bottle attests to England's importance as a centre of perfume bottle production in the mid 18th century.



Trade Card,
The British Museum,
Banks Collection
Scent bottles were sold
by merchants who
specialized in curiosities
and miniatures made of
precious metals, tortoise
shell or porcelain.

existence today were established at this time: in London, Floris in 1730 and Yardley in 1770, in Paris, Houbigant in 1775. In North America, Caswell-Massey was founded in Newport, Rhode Island, in 1752. Clients included George Washington and Captain Kidd, who shared a fondness for Caswell-Massey's perfume number six.

All these perfumes needed to be stored in containers, usually of glass or porcelain. The growing fashionability of perfume led to a parallel production of exquisite tiny porcelain bottles, called "toys," just one

among many miniature items, such as needle cases and snuff boxes, made for the delectation of the aristocracy. The earliest European porcelain perfume bottles were made at Meissen, the first factory in Europe to produce true, or hard-paste, porcelain. Initially, Meissen's perfume bottles were made in traditional "pilgrim bottle" or flask shapes, but by the 1740s whimsical forms were introduced resembling the larger porcelain figures made at the factory. Sometimes the heads of the figures became the stoppers for the perfume bottles.

After the secret of making porcelain became widely known in the 1750s, many small porcelain factories were established all over Europe. Most of these made perfume bottles. However, the main centre for the production of scent bottles was in England, at Chelsea and in several other London factories that have not yet been positively identified. One of them was the mysterious "Girl-in-a-Swing" factory, which may have been established by Charles Gouyn, one of the original partners of the Chelsea factory. The real name of the "Girl-in-a-Swing" factory remains unknown. It is named for the figure of a girl in a swing, one of the first pieces attributed to the factory.

The perfume bottles made at Chelsea during the red-anchor period (1752-58) were wonderful whimsical creations, often shaped like clusters of fruit or flowers or simple and charming figures. Naturalistic animals and birds were also popular. Later Chelsea bottles, made during the gold-anchor period (1758-69), are more elaborate. They were often sold with small shagreen or sharkskin cases. (The coloured anchors refer to the marks painted on the bottoms of the pieces.) A collection of one hundred English and Continental porcelain scent bottles in the Gardiner Museum includes some bottles with containers for more than one perfume, and others that have tiny mirrored compartments for storing beauty spots.

Perfumes were used not only in the boudoir but also in the drawing room. Pot-pourri was made from dried flowers, such as roses, orange blossoms, lavender, myrtle, oakmoss, and orris root, layered with salt and left to macerate in the sun for several days. It was then placed in porcelain containers vented with air-holes. Sèvres became particularly well known for its exquisite pot-pourri containers. Each shape was named, and many came in different sizes. A pot-pourri Pompadour in the Gardiner collection was made at Vincennes about 1750.

Rooms were also scented with perfumed pastilles that were burnt to release their aromatic smoke. At Louis XV's court, these were called *oiselets de Chypre*, or little birds of Cyprus, a curious name of unknown origin. The pastilles were formed by hand by rolling gum mixed with laudanum, storax, cloves, sandalwood, camphor, aloes, and sugar of valerian. They were lit like candles and placed inside small vented porcelain figures or special containers. At Meissen, oriental figures were made with pierced ears and open mouths for the perfumed smoke to escape. One of the most important porcelain objects in the Gardiner collection is a wonderful pastille burner in the shape of a Magot, an oriental figure. It was made at Chantilly, France, in 1740. Between the Magot's knees is a porcelain globe lined in ormolu, with a detachable ormolu lid. A pastille may be placed inside the globe and ignited, and the lid replaced. Perfumed smoke will then waft through the holes in the lid.

Originally, the Magot's hands were on pivots and they would have been set in motion to help fan the fragrant aroma throughout the room.

Perhaps the most frivolous and extravagant use of perfume is recounted in a story based upon a malicious rumour spread by the Marquis d'Argenson, one of Mme de Pompadour's most outspoken opponents. In 1750, he accused Louis XV's mistress of a "scandalous extravagance," by her squandering of 800,000 livres on

Vincennes porcelain flowers.

Vincennes had become famous for naturalistic porcelain flowers: they formed a substantial part of the factory's production in the early days. In 1748, forty-five women were employed solely to create flowers. These were made of porcelain, assembled petal by petal, and were either fitted onto painted stems, or onto wire ones wrapped in green silk.

The story gradually evolved from the Marquis's rumour. Apparently Mme de Pompadour planted a winter garden filled with thousands of these artificial porcelain flowers, at her Château de Bellevue, near Paris. Each flower was said to have been perfumed correctly; roses were scented with rosewater, carnations with carnations, lilies with lilies-of-the-valley—all this just to amuse the king at a time when most of the population was impoverished. Only recently has Mme de Pompadour been exonerated in this matter. Careful scrutiny of the records of her purchases revealed that the king's mistress purchased only twenty-four vases embellished with eighty-eight flowering porcelain plants in 1750. She spent 32,696 livres at Vincennes that year,

far less than the rumoured 800,000

livres. For his calumny, the unwise Marquis d'Argenson lost his ministerial position. Mme de Pompadour remains, nonetheless the most conspicuous patron of precious perfumes and delicate porcelain of her age.

And after all, who would not agree with Cowley

when he wrote:

*Who that has reason, and his smell,
Would not among the roses and
jasmine dwell,
Rather than all his spirits choke
With exhalations of dirt and smoke?*



Magot pastille burner, c. 1740, soft-paste porcelain, 23.5 cm high, French, Chantilly, The George R. Gardiner Museum of Ceramic Art. Perfumed smoke from a lighted pastille would diffuse throughout a room, wafted by the hands of the Magot.

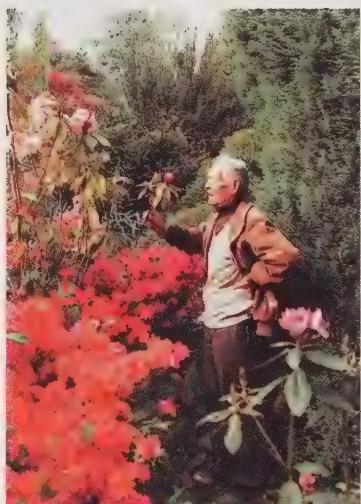


Bird-shaped scent bottles, c. 1752-58, soft-paste porcelain, English "Girl-in-a-Swing" and Chelsea factories, The George R. Gardiner Museum of Ceramic Art. Such whimsical bottles often had more than one stopper and contained a small compartment for fabric beauty spots.

NOSES IN THE KNOW

*Traditional methods for creating perfume
are coming back into style*

DAVID LIVINGSTONE



Edmond Roudnitska

PHOTOGRAPH: MICHEL ROUDNITSKA

JACQUES POLGE, DIRECTOR OF CHANEL'S LABORATORY OF perfumes, stands for the creation of fragrance—agent of both our most private delights and embarrassments—as a modest, serious, honourable thing to do.

One might never guess that this could be the case for at least two reasons. The perfume industry, like any business in which aggressive marketing counts for so much, can be coarse and inane. The air is laden with scent-strips and the curses they inspire. To carry a magazine nowadays is to go around wondering where the smell is coming from. Gales of the latest odour pour out from the entrances of stores where ground forces await, their index fingers vigilantly poised on spray pumps.

Even Leonard Lauder, president of Estée Lauder, Inc., refers to these professional demonstrators as "flame-throwers," and God knows it was not because it connoted anything retiring that the company's name made it into the Tom Waits song which goes, "The pedal pushers stretched over midriff bulge/and the coiffed brunette curls over Maybelline eyes/wearing Prince Matchabelli, Estée Lauder, smells so sweet."

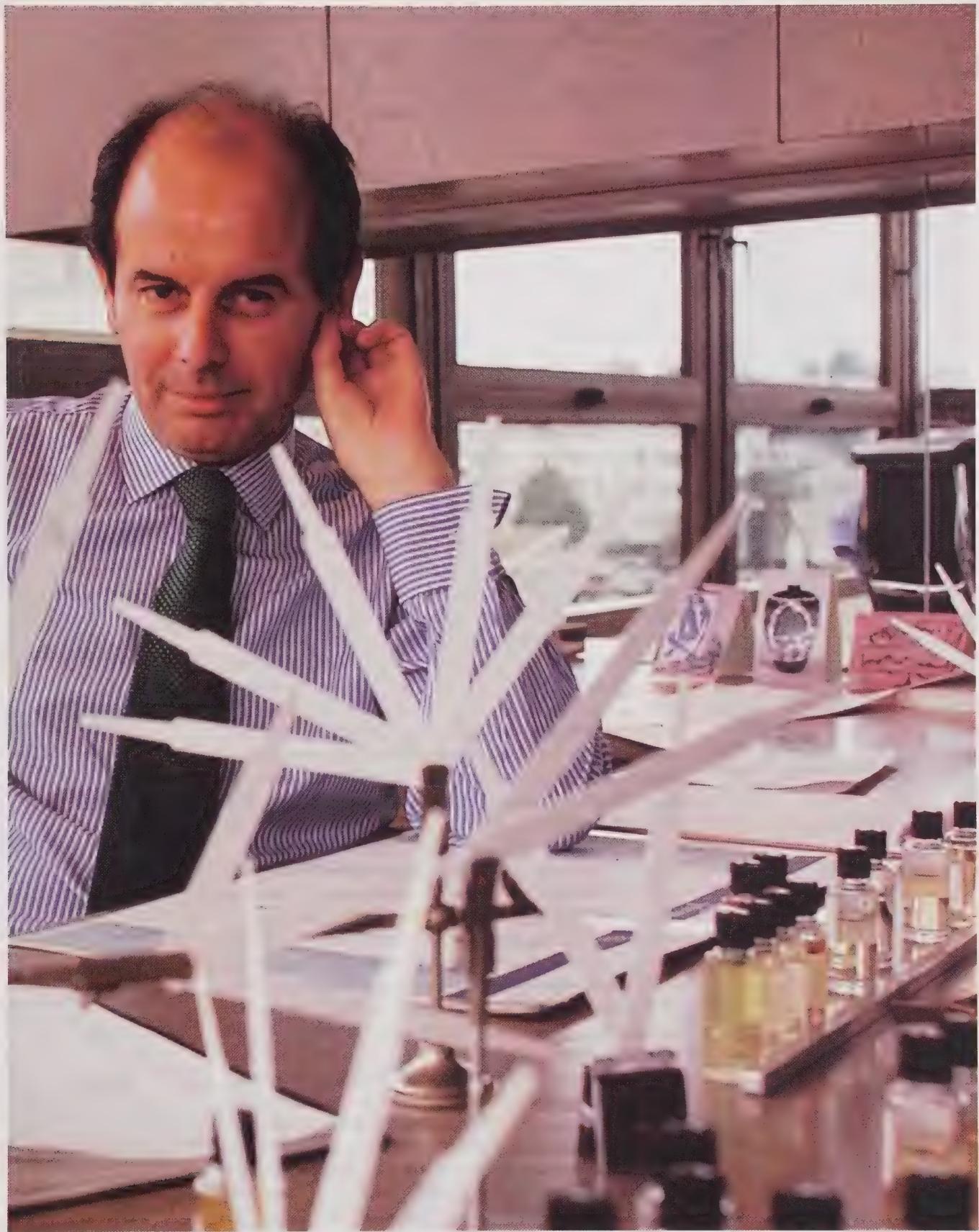
Once upon a time Baudelaire would have been hailing perfume's intoxicating charms. Today's author takes a sober view. In her novel, *Cat's Eye*, Margaret Atwood, setting a scene on the ground floor of Simpsons, sniffs, "The air is saturated with the stink of perfumes at war. ...The air is bad here, there's too much musk, the overpowering scent of money."

The second reason is the lack of respect paid to Polge and his kind in non-fiction. Books on perfume tend to lapse into cliché. They race from the Bible's Esther to Revlon's *Charlie*. They stop to note perfume's connections to religion, medicine, and the glove trade; the significance of Italy in the Renaissance, of Cologne in the 18th century. But allusions to modern creators are usually fleeting.

Journalism on the subject is apt to be equally hackneyed, typi-

Edmond Roudnitska, who created *Eau Sauvage* for Dior, in 1962, is regarded by some as the most important of living perfumers. He believes that "true creations, which demand talent and time, can only be realized by authentic artists." Jacques Polge of Chanel agrees, "You create with sensibility, imagination." Polge places aesthetics before business and fashion.

*David Livingstone is a fashion columnist
for the Toronto Globe and Mail.*



Jacques Polge

Chanel's outstanding "nose" claims to know nothing about chemistry. He feels that when creating a new perfume, a visit to an art exhibition is more valuable than a visit to a chemist.



Ernest Beaux

cally involving some dewy account of jasmine being collected at dawn in the perfume capital of Grasse. Any treatment of "the nose," the title given to the creators of perfume, is likely to be accompanied by a weak joke about noses and a photograph depicting some geezer in a labcoat. The image that remains is of someone incomplete and lifeless, someone between a cartoon character and a cadaver.

In recent years there have been some opportunities to discover that this image is inaccurate. One benefit borne of hype is that from time to time perfumers themselves are sent out to beat the drum for "product."

The standard launch is characterized by a lot of talk about top notes, bottom notes, and base notes, which are legitimate figures of speech in perfumery for describing the stages of a fragrance, but delivered as part of a pitch they sound like guff. If you're lucky, there may be a fashion designer on hand. Such are the profits to be had from perfume, that designers flack their fragrances in places that they wouldn't even visit for the sake of their clothing lines. When they do show up, they are given to strained platitudes about women and white flowers. In welcome contrast, personal appearances by perfumers are more illuminating.

A few years ago, when Thierry Wasser, creator of the Salvador Dali fragrance for men, came to Toronto, he banished a few misconceptions. He turned out to be an elegantly slender young Swiss who, when he smoked, produced his cigarettes from a narrow silver case. With a refreshing matter-of-factness, he spoke of the fern-scented water softener, which had been a previous accomplishment, and, in the wake of his latest—his first fine fragrance—seemed animated and engaged in a way that added shine to his choice of career. As further indication that, while perfume may be a commodity, perfume-making has its own culture, Wasser was familiar with Jacques Polge, was aware of his reputation, and was most impressed by it.

In his office in Neuilly, on the edge of Paris, in a building that may not be as chic as, but is no less angular than, a bottle of *N° 5*, Jacques Polge is not wearing a lab-coat. He has on a shirt, striped in vital red, and cufflinks. When he starts out by fretting about traces of cigar smoke drifting in from the floor above he seems like the nose from Central Casting, but in the course of conversation he emerges as a man of unpredictable thought and steady ideals.

Polge is not entirely romantic. When this writer, redolent of the detergent from a London laundromat, tired from travel, daunted by the prospect of discussing perfume (a subject that laughs at language), and vainly trying to buoy himself with lofty reflection on the immortality of scent, asks Polge if he knows who is buried in the cemetery outside his window, he answers, "Dead people." Yet Polge is sufficiently dreamy to say, "You don't create fragrance with the nose. ... You create with sensibility, imagination. The same thing with music. You don't create it with your ear. So, this story about a good nose, people talk a lot about it, but..."

Growing up near Grasse may have weighted the odds, but

The "noses" of Chanel have been especially innovative. Ernest Beaux created Chanel *N° 5* in 1921, thereby pioneering a family of scent that since then has come to encompass Lanvin's *Arpege*, Avon's *Trapeze*, and Saint Laurent's *Rive Gauche*. Jacques Polge, known for *Coco*, also developed *Bois Noir*, an original blend of sandalwood and vanilla, sold only at the Chanel boutique in Paris

Polge, forty-five, came to perfumery by chance. He studied literature before he switched to scent, training in Grasse for three years and then going to work in New York for Roure Bertrand Dupont, one of the large international firms that formulate and supply fragrances for fashion designers and the growing ranks of other celebrities under whose names fragrances are sold. Perfumes that lately have come from Roure Bertrand include the new *Kenzo*, as well as Alfred Sung's fragrances for men and women.

"At the beginning of the century, nobody would ever have thought of not having the creator in his operation. I mean, it's just like when you go into a restaurant, you hope there's a chef in the kitchen," explains Polge, grateful to be cooking with Chanel, now the rare couture house with its own lab. During his ten years with Chanel, Polge has created *Coco* and two men's fragrances, *Antaeus* and *Bois Noir*. Sold only at the Chanel boutique in Paris, the latter is an original blend of sandalwood and vanilla, which is, Polge is proud to say, "an accord that has not been played before."

Polge considers a close working relationship between designer and perfumer as essential and regrets that this is now rarely the case. He remembers affectionately how Germaine Cellier, the creator of *Bandit* for Robert Piguet, would tell him about dinners where she and Piguet would be "eating garlic, drinking wine, and creating perfume like that."

Polge has also made fragrances for Tiffany's, the New York jewellers, and two for couturier Emanuel Ungaro. With Ungaro he enjoyed the kind of close working relationship that he considers essential between designer and perfumer, and which he perceives to be most often missing now.

To illustrate the way it used to be, Polge finds a picture in a book that he describes as very moving. It shows Poiret, who initiated the idea of couturier fragrance in 1910, in conference with Henri Almeras, who was responsible for several of Poiret's Rosine scents, and who later created *Joy* for Patou.

With similar affection, Polge tells of getting to know Germaine Cellier, one of the century's important perfumers, who, near the end of her life, worked at Roure Bertrand. "I remember her explaining to me the way she used to work with Piguet. She told me how they would be together eating garlic, drinking wine, and creating perfume like that," recalls Polge, in tones that suggest that work habits have become less convivial.

When Cellier created *Bandit* for Robert Piguet in 1944, it was not merely a sentimental occasion. She entered perfume history because of her creative, influential use of quinolines, one of the many discoveries in organic chemistry that have made modern perfumery something other than an affair of the heart and nose. This was all the more remarkable for a woman. Fine fragrances, like fine flavours, having traditionally been a male domain.

Some hucksters downplay science lest it appear to contradict the allure and mystery that have been the bases of so many perfume pitches. But any real appreciation of modern perfumery acknowledges the function of chemicals, both natural and synthetic. When poet Emily Dickinson wrote, "The Attar from the Rose/Be not expressed by Suns—alone/It is the gift of Screws," she implied a mistrust of the mechanical and man-made. However, J. K. Huysmans, in his *fin de siècle* classic, *Against the Grain*, suggested that nature isn't everything. In his decadent treatise on artifice, Huysmans wrote,

PHOTOGRAPHY: LA FÉDÉRATION FRANÇAISE DE L'INDUSTRIE DES PRODUITS DE PARFUMERIE, DE BEAUTÉ ET DE TOILETTE



Germaine Cellier



François Coty

"In perfumery the artist completes and consummates the original natural odour, which he cuts, so to speak, and mounts as a jeweller improves and brings out the water of a precious stone."

"Why, thank you for asking, I'm wearing methyl anthranilate," obviously doesn't do, but the isolation of such ingredients, starting in the 19th century, made possible all manner of new olfactory harmonies. Creating *Chanel N° 5* in 1921, Ernest Beaux pioneered a family of scent that has come to be known as floral aldehyde—a category, variously summarized as "powerful," "sharp," "violent," that since then has come to encompass Lanvin's *Arpege*, Avon's *Trapeze*, and Saint Laurent's *Rive Gauche*.

Another major innovator was Edmond Roudnitska, regarded by some as the most important of living perfumers. In 1962 he created *Eau Sauvage* for Dior. Containing a new ingredient called hedione, *Eau Sauvage* established a trend in light scents. At the same time, Roudnitska has been one of the staunchest champions of perfumery as an aesthetic endeavour, defending the perfumer's need for freedom, calling for the right to copyright his creations, and declaring the grandeur of the profession. He has described the process of creating perfume as a combination of taste, intelligence, intuition, invention, and luck. In *Le Parfum*, one of his books on the subject, Roudnitska stated, "True creations, which demand talent and time, can only be realized by authentic artists."

Jacques Polge shares with Roudnitska this stubborn high-mindedness. "I know nothing about chemistry," Polge admits without apology. "All the materials I mix are for me nothing more than what they smell of. Whether it's an alcohol or an aldehyde, I really do not care. ...Sometimes it's more important to go to an exhibition of art than to listen to a chemist."

On Polge's desk, alongside the raw materials, the latest harvests from fields and test tubes, sit contraptions holding long, thin blotters, like robotic fingers. To convey his full esteem for a perfumer, he leaves science and draws on a literary comparison. For him not to know the creations of Ernest Daltroff (among them, *Narcisse Noir*, *Bellodgia*, *Tabac Blond*, all for Caron) would be like a writer not knowing Balzac. "You have to have read Daltroff's work."

Other required "reading" would be the precedent-setting scents by François Coty. His *L'Origan*, 1905, was a floral-spiced-amber type that prepared the way for *Evening in Paris*, and in 1921 *Emeraude*, a soft amber that predated Dana's *Tabu* and Guerlain's *Shalimar*.

For more than 150 years, Guerlain has stayed a model of the prestigious perfume house. But it is not only by virtue of its history-making fragrances, such as *Jicky*, that Guerlain has maintained its status. A Guerlain store is a model of automation: however, there are not that many of them—limited distribution reinforces an attitude of exclusivity. By contrast, Coty pursued the mass market, enjoying particular success in the United States.

Once characterized in a profile by the *New Yorker's* Janet Flanner as "one of those important little men in whom France

François Coty's business mind would have clashed with Jacques Polge's artistic temperament. Writing about Coty, who built a mass-market perfume empire, Janet Flanner of the *New Yorker* said, "His was the merchandising genius that perceived perfume as something in a lovely bottle, rather than as merely something lovely in a bottle."

has specialized since the rise of his relative, Napoleon," Coty was a megalomaniac who also dealt in politics and newspapers. A foe of Communism, he was a great believer in packages. "His was the merchandising genius," wrote Flanner, "that perceived perfume as something in a lovely bottle, rather than as merely something lovely in a bottle."

Perfume-bottle design can rank as a separate achievement. In 1984, when sculptor Nikki de Saint Phalle launched a fragrance, its flacon was topped by two erect snakes, one gold, the other polka-dotted, and to Saint Phalle's credit the scent inside is as tenderly good-humoured and erotic. In the 1930s and '40s, Schiaparelli brought a surrealist sensibility to her perfumes: *Shock*, named after her favourite pink, was bottled in a female torso; *Sleeping* rested in a candle; *Roy Soleil* was crowned with a sunburst designed by Dali. In 1921, *Chanel N° 5* not only inaugurated a new fragrance type; its bottle set a standard of modern graphic and industrial design. Even one of the more restrained biographers of Chanel herself, Edmonde Charles-Roux, grows gushy on the subject of the bottle's style. "It transferred the imagination to a different dimension...the emphasis shifted to the one faculty really concerned: the sense of smell, brought into confrontation with this golden fluid imprisoned in a crystal cube and made visible solely in order to be desired."

The immortal Coco Chanel would have appreciated Polge's combination of tradition and innovation regarding perfume. Chanel N° 5 not only inaugurated a new fragrance type; its bottle set a standard of modern graphic and industrial design. "This golden fluid imprisoned in a crystal cube and made visible solely in order to be desired."

Central to Jacques Polge's style as a perfumer is the same emphasis on contents. Taught by the son of Jean Carles, who created *Tabu*, *Ma Griffe*, and *Canoe*, and who advocated a methodical approach to the nose-in-training, Polge learned to group raw materials by note (balsamic, citrus, woody, fresh floral, etc.) and to classify them according to their long-lastingness. Beyond that, Polge adheres to his own code, which places aesthetic questions above matters of business and fashion.

Throughout the 1980s, business and fashion have exploited all aspects of fragrance. While the child plays with scented markers and stickers, its parents go to the aromatherapist. Homes are made fragrant by new disc technology as well as by a revival of pot-pourri, a quaint notion made to seem very modern by such strictly contemporary labels as *The Smell of Christmas* and *The Smell of Love*. Brazenness has been all the rage.

Old scents have been updated to be more tenacious; new ones are appearing all the time. One of the most recent is simply called *!* And while the mode in fragrance is said to be shifting away from heavy exotics towards classic florals and, in marketing, away from bally-hoo, the effect of recently successful blockbuster perfumes—for example, *Opium*, *Poison*, and *Giorgio*, have raised the stakes, making survival a still keener proposition.

Jacques Polge awaits the passing of this cycle in which business has become so competitive that companies, instead of nurturing young talent, are raiding each other's ranks. He longs for an end to fatuous marketing. "You see, people think that with millions' worth of publicity they can do the job." And Polge will grant that what they can do is its own brand of wonderful, but he adds, more profoundly awed, "You don't avoid the problem of creation."



Coco Chanel

PHOTOGRAPH: HORST



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PHOTOGRAPHY, THE TORONTO STAR

Kevin Seymour, a paleontologist at the Royal Ontario Museum, holds the mysterious whale vertebra. His photo and story appeared in newspapers across the country and beyond.

The Tail of a Whale

ON 18 APRIL 1988, ONE ISOLATED, fairly complete whale vertebra was discovered at Queen's Quay and Bay Street during the excavation for Toronto's new Harbourfront Light Rapid Transit line. The "Queen's Quay Whale" was reported to have been found approximately 1.5 metres below landfill that was first deposited in Lake Ontario during the early part of this century. We will probably never know at exactly what depth the bone was found because it was discovered only after it had been removed from the ground.

This was apparently the first evidence of marine life in the Toronto area dating after the last glaciation. No other sign of marine life from this time had ever been found west of a line joining Pembroke and Brockville. More important, since

Toronto was some 100 metres higher in elevation than Brockville during the last ice age, a Toronto ice-age whale would cause some major rethinking of Toronto's glacial history. A carbon date was absolutely necessary to determine whether the geography and fauna of Toronto was quite different during the ice age than was commonly believed, and so a small sample of the whale bone was submitted for dating. As well, samples of the original lake-bottom sediment from this excavation were removed to be tested for preserved pollen grains. They reveal what flowering plants were growing in an area at the time sediment was deposited and this in turn can help to date a site.

Unfortunately, before any results could be obtained, the media reported the find. Media attention

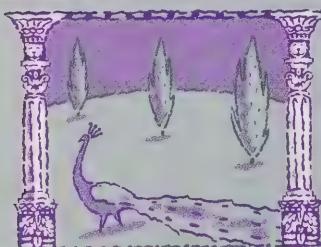
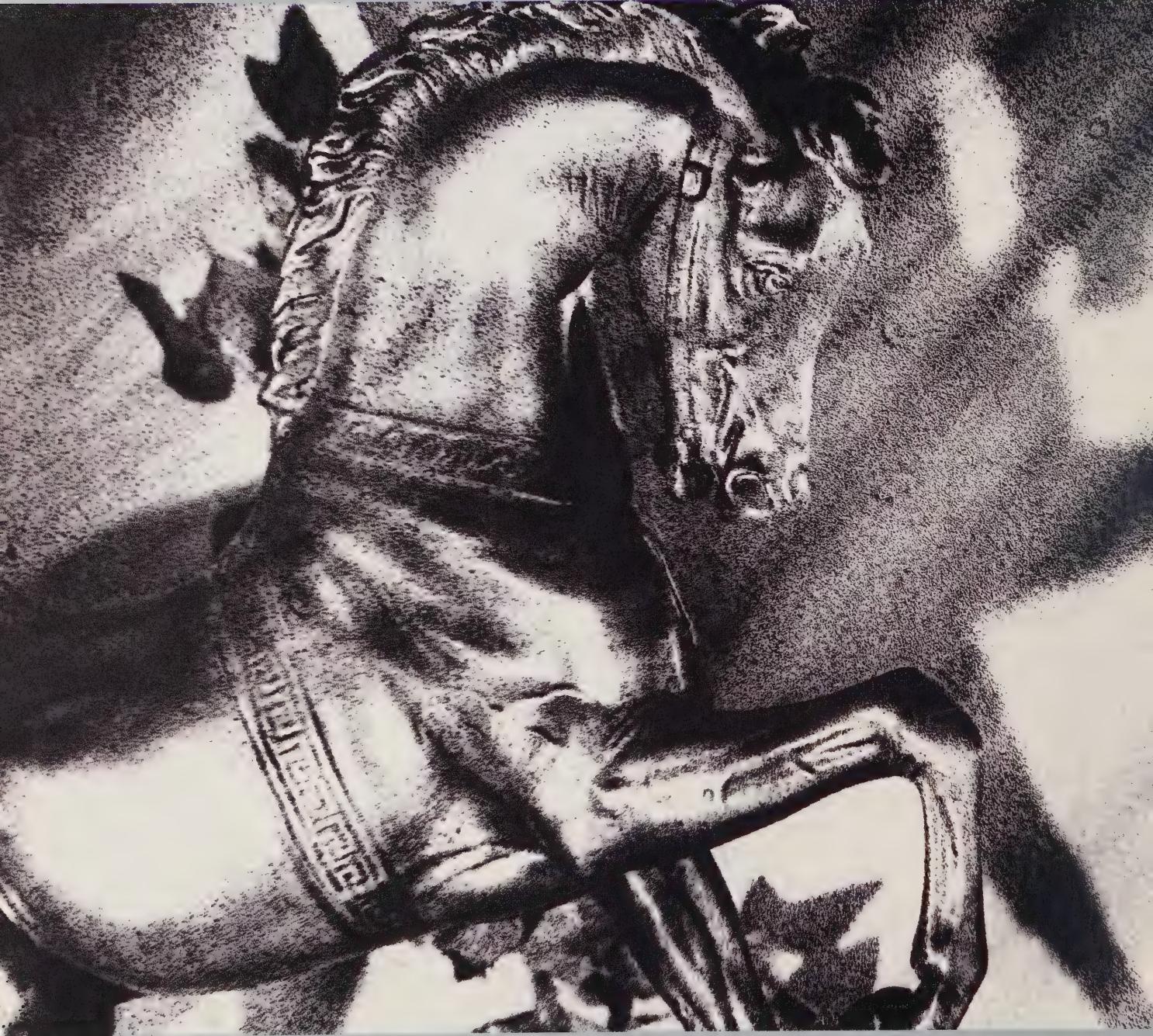
was intense for the first few days with the announcements of the possible rewriting of Toronto's glacial history. Headlines included one from the *Los Angeles Times* that read: "Bone discovery could have whale of impact." Later, after a tip from a local historian, it was reported that the bone was probably discarded from Piper's Zoo, an 1880s Barnum-and-Bailey-type museum that used to exist on the old Toronto lakeshore. However, the analyses now indicate that neither of these stories is correct.

The bone was confirmed to be from the lower back of a medium-to large-sized whale, although the species is still undetermined. Comparisons among bones of various living species of whale still need to be made in order to identify the vertebra properly.

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WHALE CONTINUED

Test results indicated that the whale bone dated from A.D. 1828 plus or minus 125 years if the whale had lived in the Atlantic Ocean. This range of time represents the uncertainty of carbon dates, which are affected by the variable amount of carbon in the atmosphere. In the case of a marine animal, an additional adjustment must be made because there has been a variable amount of carbon in the different oceans. Although these dates definitely eliminated the possibility of this whale's having lived during the ice age, they did not eliminate the Piper Zoo theory.

This is where the pollen analysis was useful. Pollen of at least one introduced European plant, prickly lettuce, was present. However, the best indicator of European settlement at any site is large amounts of ragweed pollen because this is more prevalent after the natural environment has been disrupted by man. In the Toronto area, sediment

samples usually show an increase in ragweed pollen around 1840. Ragweed pollen was evident only in trace amounts where the whale bone was excavated, which suggests that the layer from which the bone is thought to have originated predates 1840. This also assumes that ragweed pollen had not been destroyed from this layer. Although new evidence suggests that this may have occurred, the pollen analysis probably still eliminates the Piper Zoo theory.

Since the two postulated explanations for the whale bone's having been found in Toronto seem unlikely, the only other reasonable explanation is that someone, perhaps a whaler, brought a single whale bone to the Toronto area. The bone was later lost or discarded in the shallow water of the 19th-century Toronto harbour, only to be rediscovered in 1988.

Because there is no accurate way to date the whale bone, it is impossible to correlate this find with his-

torical records. However, the whale-bone find is not unlike another recent Toronto discovery that did reveal new information about life in the ice age.

A very unusual deer antler was uncovered just beyond Islington Station during the construction of the Bloor subway extension in 1977. The specimen turned out to represent a previously unknown type of ice-age deer, subsequently named *Torontoceros*. As with the whale bone, if an alert backhoe operator had not stopped to retrieve the antler, this species would remain unknown.

We have no way of knowing beforehand which finds may reveal significant new information regarding our prehistory. Although the "Queen's Quay Whale" remains a mystery the "Islington Station Deer" proves that there are still mysteries to be exposed and unravelled right under our own feet.

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Atlantic Fishes of Canada

Atlantic Fishes of Canada

W. B. Scott and M. G. Scott
Canadian Bulletin of Fisheries and Aquatic Sciences no. 219
 731 pp. \$45.00 in Canada; \$54.00 outside Canada (cloth)

"WHY CAN'T I BUY A CANADIAN BOOK on Canadian fishes?" is a question all too regularly directed to ROM ichthyologists. In fact, however, Canadian fish fauna is widely recognized as one of the best documented. With this book there are now four major texts, other than provincial books, on the subject of Canadian fishes.

Atlantic Fishes of Canada is a replacement for a previous text, *Fishes of the Atlantic Coast of Canada*, published in 1966, which served for years as the international reference book. Started by A. H. Leim and finished by W. B. Scott, the latter was called a step in filling the need for an authoritative reference, but it has now been out of print for a decade.

Atlantic Fishes of Canada is that authoritative volume. It makes available a wide variety of information that will be of use to many including commercial fishermen, processors, those responsible for regulations governing the harvest and export of Atlantic fishes, divers, sea anglers, teachers, students, beachcombers, ichthyologists, and palaeontologists.

The fishes covered are those known to occur in the northwest Atlantic (including the Gulf of St. Lawrence) from Cape Chidley (the northernmost tip of Labrador) to the international boundary; from the shore to a depth of about 1829



This book is the authoritative text on the fishes of Atlantic Canada. The Scotts bring to the book information resulting from a unique blend of expertise, training, and experience.

metres (1000 fathoms). In the 1966 text, approximately 250 species were documented. The new text covers 538 species, thus giving a far more accurate picture of the true extent of the fauna.

The Scotts, a husband-and-wife team, bring to this book a unique blend of expertise, training, and experience, and the benefits of affiliation with allied agencies. Both authors have long been engaged in making information on fishes available to others. Work on the book began at the Royal Ontario Museum and was completed at the Huntsman Marine Science Centre, St. Andrews, New Brunswick, the institution with which the authors

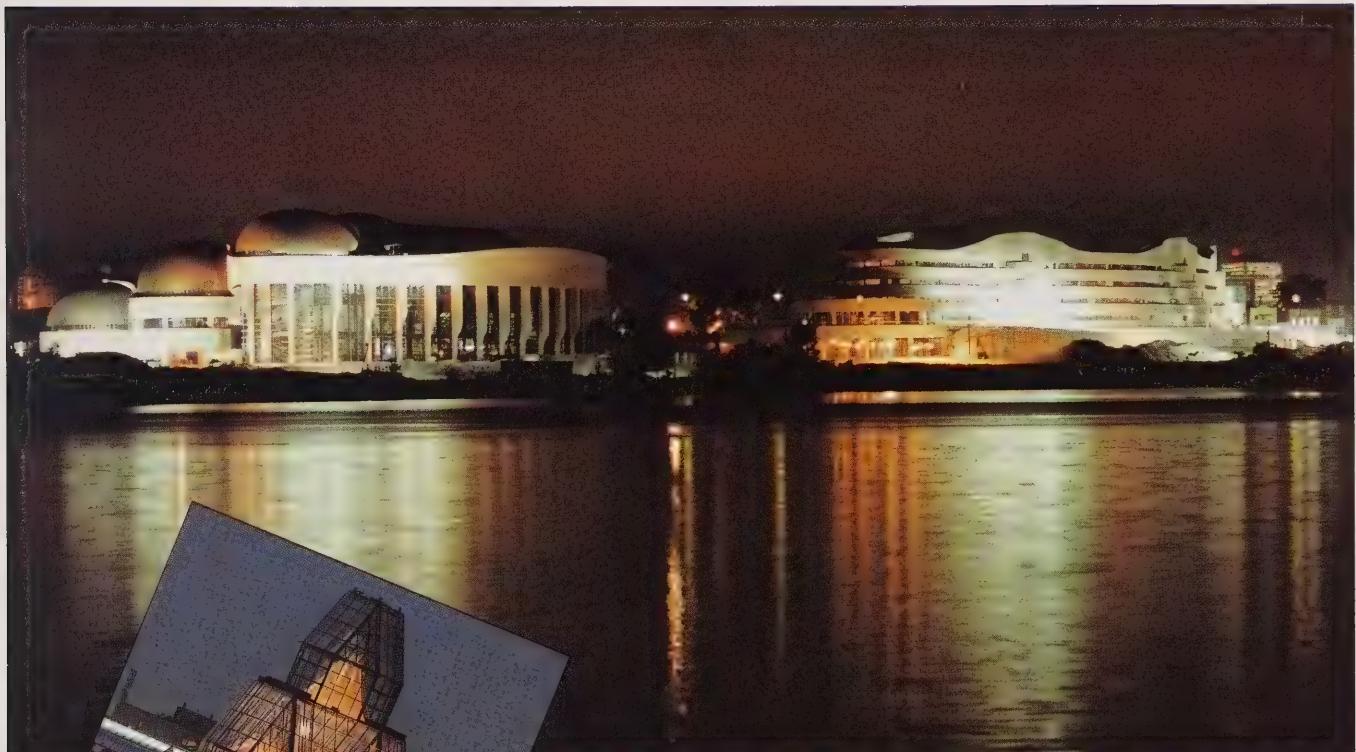
are now associated. The treatment is thorough, in part because the authors were able to draw on the knowledge and material available at the various biological stations of the Department of Fisheries and Oceans on the Atlantic Coast, the Atlantic Reference Centre, and a number of natural history museums. However, the book is largely the result of the independent, persistent, and—to a great extent—voluntary efforts of the Scotts.

Most of the book consists of accounts of individual species: the amount of text allotted to each species reflects the availability of information and the importance (usually to man) of that species. Treatment varies from "full" accounts of several pages for such species as the Atlantic salmon, which are of commercial importance and/or year-round residents in the area, to "abbreviated" or "annotated" accounts of five to ten lines for rare species often known only from one or two specimens. A full account includes: habitat, reproduction, growth, food, predation and competition, parasites and diseases, distribution, importance to man, description, systematic notes, and common English and French names when they exist. Some rare species have no common name. There is a description of the distribution of most species, and for each of thirty-nine important species there is a map showing its range. The organization of the material in the book, including a helpful index, makes it easy for lay and professional readers to identify fishes.

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REVIEW CONTINUED

a black-and-white outline drawing, a detailed line drawing, or photographs of fresh or museum specimens. In addition to the black-and-white illustrations there are twenty-three colour reproductions of paintings and photographs. One of these, a painting of an underwater scene of a group of Atlantic cod, provides an attractive illustration for the dustjacket.

The authors have also provided useful background and supplementary material related to the Atlantic fish fauna. This includes a review of the Atlantic Coast fisheries and fisheries research in the last twenty-five years, the oceanography of the area, a detailed map of the area, and a checklist or "quick guide to the fishes" in taxonomic order. There is a glossary of terms used in the keys and text and a separate explanation of abbreviations.

A number of small design elements, possibly intended to save space, unfortunately reduce the readability of the text. These include limited spacing between the accounts of species, numerous intrusive horizontal lines, the placing of the name and illustration of a species at the bottom of a page with the text starting on the next page, and the separation of the figure and text description sometimes by several pages.

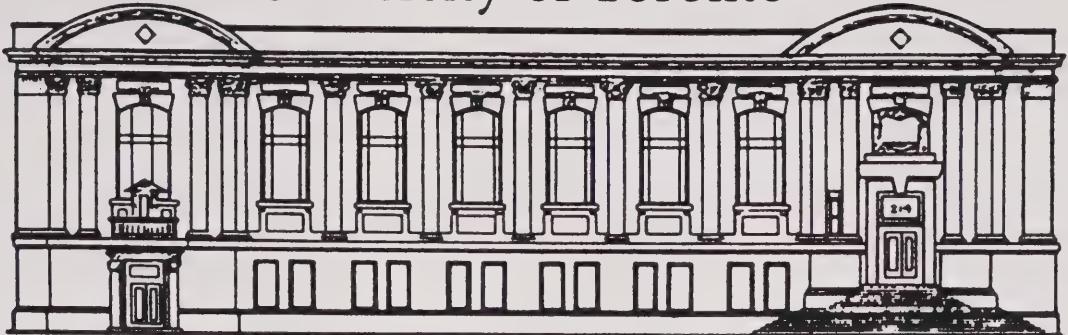
However, the advent of this authoritative text on the fishes of the Atlantic Coast of Canada is a welcome one, and hopefully it will be readily available to all potential readers. This should reduce or simplify the number of telephone calls to the ROM from enquirers ranging from cooks to customs officers, seeking information about these fishes. For their work I congratulate the authors and publishing agencies. The French language edition of the book is in preparation and will be available in the near future.

Reviewed by DR. E. J. CROSSMAN, a curator in the Department of Ichthyology and Herpetology, Royal Ontario Museum

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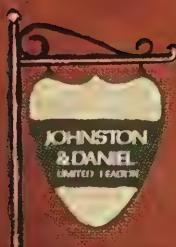
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LETTERS

Fast bread

As members of the Museum, my husband and I receive and enjoy reading *Rotunda*. We were particularly interested in the article "The Story of Dough" (Volume 21, no. 3). We found it well researched, engrossing, and nicely illustrated. However, there is now a new bread-making method that reduces total time taken to two hours and requires no kneading. This method is based on the use of two nutritional supplements, gluten flour and calcium ascorbate (a form of vitamin C).

A long time bread-baker myself, I developed this method over a period of time by trial and error, and I've written a book called *Bread-speed*, in order to share my discoveries with others. On more than one occasion, in radio and TV interviews about *Bread-speed*, I've referred listeners to the *Rotunda* article for a discussion of the traditional method.

ELMA SCHEMENAUER
WILLOWDALE, ONTARIO

A second thought on dinosaurs and kangaroos

Kevin Seymour of the ROM's Department of Vertebrate Palaeontology has more information for *Rotunda* reader C. H. Simpson.

In one sense dinosaurs and kangaroos are so distantly related that we can say there is no connection. On the other hand, C. H. Simpson is quite correct in noting the similarity in overall body proportions. Indeed, when the famous Belgian *Iguanodon* (a type of hadrosaur) skeletons were first being mounted in 1879, there was some question as to how the skeleton should stand. For instance, did *Iguanodon* walk on four legs or two legs? With no close living relative to use for compari-

son, the scientists looked for living animals with somewhat similar body plans to aid them in deciding how to position the dinosaur skeleton. They ended up using two species—an emu (a large flightless bird similar to an ostrich) and a wallaby (a small type of kangaroo). Hence this early restoration ended up looking something like a hybrid of the two—the hind end positioned like a wallaby and the front end like an emu. So this similarity was noticed even one hundred years ago.

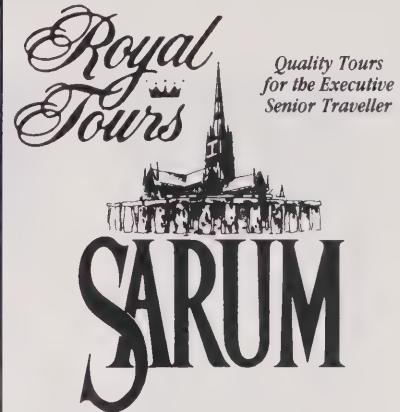
What does it mean? Modern analyses suggest that some dinosaurs may have lived and moved like ostriches. The hadrosaurs, however, are not thought to have moved like kangaroos. We must conclude that the similar body proportions of kangaroos and hadrosaurs such as *Iguanodon* are more or less coincidental. However, it was quite perceptive of C. H. Simpson to notice the similarity. Scientific breakthroughs are often made by making just these sort of seemingly odd connections.

KEVIN SEYMOUR
DEPARTMENT OF VERTEBRATE
PALAEONTOLOGY

The cobblestones of Belleville

We received the spring issue (Volume 21 no. 4) this morning and noted the article on the cobblestone houses of Paris. There are several of these cobblestone houses of the same vintage in Sidney Township a few miles northwest of Belleville, which the author might like to take a look at. Our Architectural Conservancy of Ontario Quinte Region Branch inspected them on a recent house tour.

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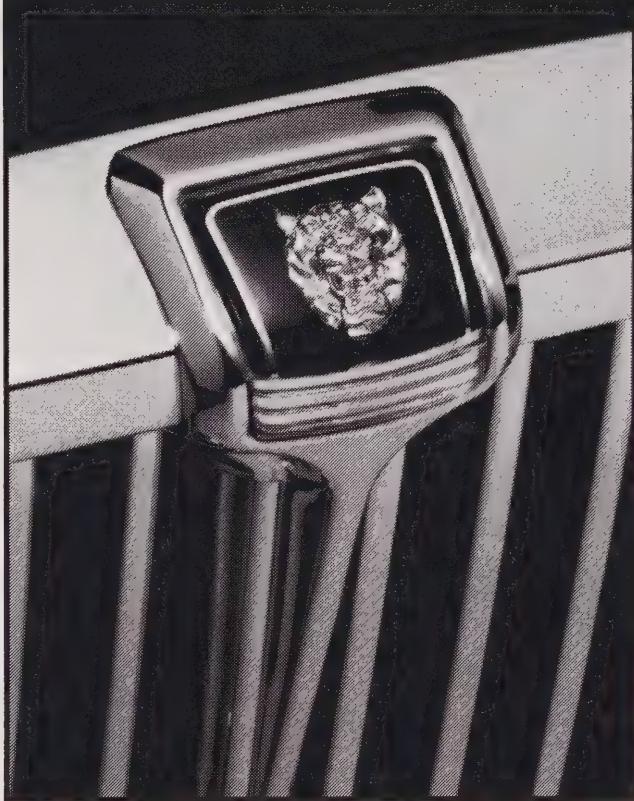
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QUIZ

JAY INGRAM

This Quiz is Bugging Me

1. A common household appliance has been adapted to rid California's strawberry fields of insect pests. What is the appliance?
2. Dr. Kinga Kovalevska-Grachowska of the University of Alberta recently succeeded in reviving bugs—bacteria—from the frozen bodies of the men of the Sir John Franklin expedition, who died in the Arctic 140 years ago. That was amazing enough, but these common species of intestinal bugs were also resistant to the antibiotics clindamycin and cefoxitin. Why was that so surprising?
3. The world of bugging—electronic eavesdropping—has become tremendously sophisticated over the last decade. Take the example of the low-power laser that you can shine on the window of a room in which there are people whose conversation you would love to hear. What can the laser do for you?
4. How did Bugs Bunny get his name?
5. Research on the eyesight of leopard frogs in the 1950s showed that there are single nerve cells in the frogs' brains that are specialized as "bug detectors." An object in a leopard frog's field of vision must have three characteristics to register with the bug detector cells: it must be small, it must be dark and...what's the third property?



THE ANSWERS

1. A vacuum cleaner. This one is called Bugvac, and it was invented by entomologist Edgar Show. Strawberries in California are plagued by an insect called the lygus bug. The bug is susceptible to pesticides, but so are many of the beneficial insects of the strawberry patch. Bugvac is a big vacuum mounted on a tractor that rolls along creating an upward wind at the plant-tops of up to about 60 kilometres per hour (40 miles per

hour). The lygus bugs inhabit the upper part of the strawberry plants, and they get sucked into the duct-work of Bugvac and crushed. Their little carcasses are then sprinkled back onto the field. Mr. Show claims that the beneficial insects seem to be agile enough to clear out from the tops of the strawberry plants when the Bugvac approaches. Unfortunately the machine doesn't wipe the lygus bugs out completely, but their popula-

tions are at least brought down to a tolerable level.

2. It was amazing because antibiotic resistance is supposed to arise when populations of bacteria are flooded repeatedly with large amounts of antibiotics, something that only happened when antibiotics came into widespread use after World War II. The theory is that there are always occasional bacterial cells that happen to be antibiotic resistant,

but that this is never a significant advantage until almost all other bacteria are killed by the antibiotic. Only then can the resistant cells multiply without competition and become common. But if these bacteria had acquired resistance a century before antibiotics, there must be some other explanation. Dr. Kovalevska-Grachowska suspects that these bacteria, while adapting to the high levels of lead in these bodies (that's apparently what killed the men) may have also developed antibiotic resistance.

3. The laser can eavesdrop on those conversations. Voices in a room will make the windows vibrate slightly in response to the sounds. A laser beam aimed at the window will be disturbed by the moving glass, and as long as there is a reflective surface inside the room (this obviously has to be planned ahead), the altered beam will return to its source. It's then diverted into a photodi-

ode, where the disturbances of the beam are translated into variations in an electrical circuit. It's a simple matter to amplify and filter these variations and send them to a speaker, where the original conversation is then reproduced. (Filters to remove the low-frequency sound caused by the wind and building vibrations are apparently a must.)

4. Unfortunately there's nothing romantic or exotic about "Bugs." In the late 1930s Warner Brothers director Ben Hardaway asked cartoonist Charles Thorson to come up with a pencil sketch of a rabbit. Ben's nickname was Bugs, and Thorson made a note on the corner of his drawing, "Bugs' bunny." The famous rabbit made his débüt in 1938 in Hardaway's *Porky's Hare Hunt*. In 1940, in *A Wild Hare*, Bugs first uttered his immortal, "What's up, Doc?"

5. The object must be small, dark,

and moving. In particular, it must be moving erratically. This of course means that the bug detector cell, properly known as the "convex-edge detector," fires excitedly whenever a fly buzzes across the frog's visual field. The beauty of this system is that the frog's eye and brain work in concert to eliminate useless information and to concentrate only on information that has survival value. Other brain cells in the leopard frog respond to potential predators. One reacts to objects that move then stop in the field of view, as a stalking heron would; another responds to dimming light, such as that produced by the shadow of a hawk. On the other hand, the frog literally does not see large unmoving objects, like trees and stones. This abstraction of useful information does have a potential downside: were a leopard frog to be surrounded by dead flies, and dead flies only, it would starve to death because it wouldn't see them.



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